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HOW SHOULD WE MEASURE EXPERIENTIAL LEARNING?

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The question "What is experiential learning? is one that has been asked frequently in ABSEL. In fact, Gentry (1990) used this question as the title of a chapter in the ABSEL Guide to Simulation Gaming and Experiential Learning. and Gentry (1981) and Ward (1981) also used the same title for editorials in the ABSEL News and Views. But, to a large extent, the discussion has really focused on what is experiential teaching, as much of the verbiage has dealt with the pedagogical domain. Is an internship "experiential learning?" Is computer-assisted-instruction? Part of the issue related to the identification problem which ABSEL itself faced: what topics are appropriate for papers to be given at the yearly conference, and what ones are not? What has resulted is a focus on pedagogy as seen by the instructor or by the developer.

There is no doubt that ABSEL Conference participants, nearly all of whom have been instructors themselves, have been avid listeners to the many papers which describe the structure and play of a new pedagogical approach. However, the focus on experiential teaching has obscured somewhat the role that students play in all of this; what do they get out of it? The fact that most discussions of new ABSEL pedagogies have little or no discussion of the debriefing sessions following their implementation is symptomatic of this problem.

Gentry (1990, pp. 9-10) justified his focus on the teacher rather than the student by waffling through the following:
Thus he went on to focus on the issue of which approaches
facilitate experiential learning under the implicit assumption that one will learn what is desired from experience. We assert that the emphasis on the process of teaching rather than on the process of learning has resulted in too little attention being given to what is learned. Instructors may know what they want to have learned and they usually know what students are being exposed to, but too frequently they fail to ascertain systematically what students walk away with.

Members of ABSEL are dedicated to the proposition that students can 'earn from experience. In general, most people adhere to the notion of "trial and error" learning. Various ABSEL participants have used the following quote, attributed to Confucius, to express their conviction that experiential learning is effective:

> I HEAR AND I FORGET
> I SEE AND I REMEMBER
> 1 DO AND I UNDERSTAND.

Others have cited Sophocles' quote from 400 B.C., "One must learn by doing the thing, for though you think you know it--you have no certainty, until you try. Or, one could quote George Santayana, "The great difficulty of education is to get experience out of ideas.

Thus, there would seem to be superficial face validity that one learns from experience -- who is to argue with Confucius? But what are we learning? And, more importantly, how do we measure what has been learned?

Kelly (1955) described the inductive nature of trial and error learning, noting how learning and "experience are intertwined:

> The person who merely stands agog at each emerging event may experience a series of interesting surprises, but
> if he makes no attempt to discover the recurrent
> themes, his experience does not amount to much. It is when man begins to see the orderliness in a sequence of events that he begins to experience them

From the standpoint of the psychology of personal constructs, it is the learning, which constitutes experience.

It is hard to argue that experience will not lead to learning under the right conditions. However, there is strong evidence (Einhorn and Hogarth 1981; Jenkins and Ward 1965; Ward and Jenkins 1965; Wason 1960) that resultant learning from experience can be in error unless care is taken to assure that those conditions occur. Recent research in behavioral decision theory (Hoch and Deighton 1989; Hoch and Ha 1986; John, Scott, and Bettman 1986) has indicated that people are subject to a confirmation bias when "experience" is ambiguous; the lack of definitive disconfirmatory evidence is construed as being supportive of prior beliefs. Most people do not go into an experience with the explicit goal of seeking disconfirming evidence, and thus one's implicit hypothesis of how things work rarely receives a rigorous testing.

WHAT IS LEARNING?" AND HOW SHOULD WE MEASURE IT?

Although learning can be defined easily as a change in cognition, attitudes, or behavior consistent with the desires of the educator, there are some troublesome considerations in this criterion. Fundamental difficulties exist in the customary measurement of learning.

First, there is usually no baseline to use in determining whether or not the learner entered the experiential environment with the learning already achieved from some other experience. Second, the assessment of learning has an inherent subjective aspect in that some minimum level of performance or change in performance must be identified as the point where learning has been demonstrated. Third, most tests of learning are custom-made and are never subjected to rigorous reliability and validity assessment. For instance, performance in the exercise may be unrelated to understanding of the concepts involved and this approach to measuring learning has been strongly criticized (Greenlaw and Wyman 1973; Parasuraman 1980). Further, there is question as to whether the bottom line is even an adequate measure of performance (Biggs 1987; Teach 1990). The recent stream of research by Anderson and Lawton (1991) and Patz (1990; Patz, Milliman, and Driver 1991), which has found that those classified as analytics by the Myers/Briggs instrument tend to perform better in business policy simulation games, would seem to mean that games reward players for their basic skills obtained prior to this particular course. Is not the more relevant question whether or not games help non-analytics become more analytical as a result of the experience?

In order to consider such a question and to develop methods that will produce this specific educational outcome, we need to determine just what is to be learned in experiential instructional settings. A diverse set of issues and possibilities is represented in the instructional psychology literature (see Gagne and Dick 1983; Glaser and Bassok 1989; Pintrich et al. 1989). As noted by Glaser and Bassok (1989), attention to three areas can yield significant insights: First, attention should be given to isolating and describing competent performance in terms of both knowledge and skill. Second, both design and assessment should take the learners' initial knowledge and ability into account. Third, we need to focus on the process of learning and explore how learning actually transpires.

Most of what has been studied pertains to early education, thus we should exercise caution in borrowing and applying the principles identified in this literature. Since only a few of the perspectives found there have crossed-over into the business literature, a number of productive research paths can be identified using this foundation (see Burns and Burns 1990 for a recent enterprise in this vein). We find that important areas of learning are probably being neglected by business educators-- areas defined both in terms of instructional content or

design and in terms of assessment. Broadly viewed, the Western focus on intelligence tends to overlook affective, aesthetic, kinetic and tacit forms of knowledge (Gardner 1983). In general, greater attention has been given to the acquisition of language systems and concepts than to the phenomenological, epistemic, and practical aspects of knowledge.

In this discussion, we focus on a subset of practical knowledge of particular importance, namely tacit knowledge. In the educational literature, there is a powerful impetus to discover the underlying aspects of intelligence, namely the lack of correspondence between performance in real-world pursuits and performance in school that is widely reported. In Neisser's (1976) view, this situation exists because formal education tends to cover only a subset of what is required in the real world. Performance and pedagogy in education systems tend to reflect what he labeled "academic intelligence, which differs from the intelligence required for performance in natural settings. While experiential pedagogy represents movement in the right direction on a theoretical level, absent a formal appraisal of the relevant tasks, which students are expected to perform with competence, problems in bridging the gap between real world and academic performances should be expected. Moreover, we assert that attempts to identify the bask processes and foci of experiential 'earning will continue to be thwarted until significant attention is given to the facets of practical intelligence.

Though it is generally the case that the specific aspects of practical intelligence have not yet been identified, and that they will need to be developed on a case- or context-specific basis, conceptual guidance is provided by Wagner and Sternberg (Sternberg 1986; Wagner 1987; Wagner and Sternberg 1985, 1987). They define tacit knowledge as that which is not typically expressed or stated openly, not directly taught, or spoken about. it can be taught, but the stuff" is typically disorganized, informal, and relatively inaccessible, making it is-suited for conventional methods of formal instruction. The key is not that it can't be taught or spoken, but that for the most part, it is.....not taught or spoken.

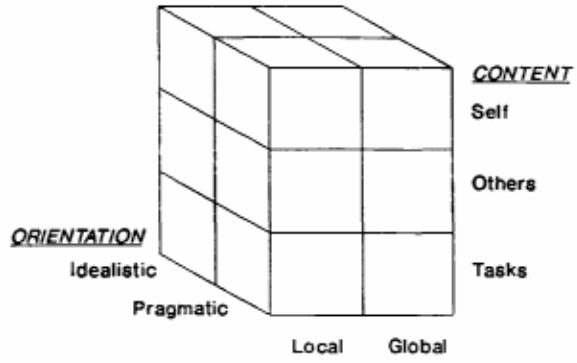
There are three dimensions of tacit knowledge, and each dimension can be further delineated as shown in Figure 1. The content of (tacit knowledge can pertain to managing oneself, others, or tasks. The contextual representation in tacit knowledge is either local (short-range, self-contained), or global (long-range, big picture). The orientation aspect of knowledge (representing both a behavioral and a motivational force) can be either idealistic or pragmatic. These facets of tacit knowledge have been tested and empirically separated from other identifiable aspects of knowledge (see Wagner 1987). Though largely confined to interpersonal skills and abilities, the distinction seems generally justified. Further efforts are needed to determine the extent to which these distinctions hold in other areas of competence.

As to the use of experiential learning to provide this practical knowledge, Wagner and Sternberg (1987) comment that many "experiential" devices are not simulations of real-world tasks. Commenting specifically on the use of the "in-basket" exercise to develop and test applied understanding, they offer the challenge which many ABSEL members (should) have experienced: "This approach has considerable face validity (i.e., performance by the test is similar in appearance to the criterion performance), but it can be difficult to decide which aspects of a job to simulate and what standards to use in evaluating performance in the simulation" (p. 438).

To apply the concept of tacit knowledge, we must begin by isolating the types of knowledge acquired and actually applied in real-world settings. Traversing each of (the dimensions suggested in Figure 1, the methods might involve observational procedures, critical incident techniques, and perhaps the backward and forward chaining procedures used to develop expert systems. Following this step, programs, exercises, and other pedagogical treatments can be designed. This isolation is also required to measure the extent to which experiential programs will (and, perhaps, already do) contribute to practical performance competencies. To the extent that students participating in experiential programs have an easier time making the transition to the real world, we may already have an indication that practical intelligence is being acquired. What is important, is to know what practical intelligence is, which aspects can and should be acquired, and how it can be acquired.

Another useful distinction that will help in this regard is one which supersedes the concept of tacit or practical knowledge. In instructional and cognitive psychology the distinction between declarative and procedural knowledge is often used in discussions of competency (cf. Gagne and Dick

Figure 1
The Tacit Knowledge Framework



Wagner (1987, p. 1237)

1983). The former concerns the contents of the nodes in an associative network—the facts, figures, concepts, etc., while the tatter concerns the linkage between these nodes and specific processes for applying the facts, etc. "Experiential' learning deals primarily with the development of procedural knowledge; however, we sometimes attempt to measure it with instruments designed to measure declarative knowledge (objective exams, for example). The central thesis of this paper is that we need to focus on measures of learning that really capture the changes in procedural knowledge produced. Additionally, emphasis should be placed on determining the tacit forms of knowledge required for performance.

The issue of whether our measures of (learning are properly matched to the type of learning involved has been dealt with previously in ABSEL. Schellenberger (1981) noted, (or example, that some exercises may emphasize the learning of knowledge or the development of specific skills. Parasuraman (1981) has claimed that a goat of business simulation gaming is to teach students the process of effective decision-making.

A common solution to the proper measurement of 'earning has been to use Bloom et al. 's (1956) classification scheme which identifies six different levels of cognitive learning. This scheme is summarized in Figure 2. The Figure describes each level and the appropriate assessment mechanism(s) for each. The Bloom et al. taxonomy is particularly relevant to business experiential learning assessment since it accommodates decision- making learning. The classification/measurement scheme emphasizes the need to identify early the level of learning sought by the experiential. If, for instance, its purpose is to provide an awareness of the general topic area, methodologies aimed beyond the more basic levels of learning may be counter- productive. On the other hand, if the objective is to improve students' abilities to apply concepts, the use of multiple choice questions from the instructor's manual is inappropriate. The level(s) of learning affected by an experiential exercise must be delineated and matched with the proper means of the assessment.

Granted, adoption of the Bloom et al classification scheme [or some other systematic representation of knowledge, such as those by Galotti 1989; Glass and Holyoak 1986; Mayer 1987; Nummendahl 1987] does not solve all the various problems in the assessment of (learning noted earlier. However, the Bloom taxonomy does provide a framework within which to begin systematically working on these difficulties. At the very least, its adoption permits the evaluator to match the domain of learning, delineated in the learning objectives of the experiential exercise, with the level of learning identified in the taxonomy and to select an assessment vehicle which is consistent with both. The scheme offers guidance in the pursuit of (internal validity and provides a structure for the measurement of 'earning across studies helpful to external validity concerns. In the following section we offer a brief example of this perspective.

Mehlhoff (Mehlhoff 1991; Mehlhoff and Mauldin 1990) presented the details of an elaborate class exercise used to provide interior design students

Figure 2

BLOOM'S TAXONOMY OF LEARNING OBJECTIVES

Learning Objectives	Description of the Learning	Student is Assessed by:
1. Basic Knowledge	Student recalls or recognizes information	Answers to direct questions and multiple choice tests.
2. Comprehension	Student changes information into a different symbolic form	Ability to act upon or process information by restating material in his/her own words.
3. Application	Student discovers relationships, generalizations and skills	Application of knowledge to simulated problems.
4. Analysis	Student solves problem in light of conscious knowledge of the relationship between components and the principle that organizes them.	Indentification critical assumptions, alternatives and constraints in a problem situation.
5. Objective Synthesis	Student goes beyond what is known, providing new insights	Solution of a problem that requires original, creative thinking.
6. Objective Evaluation	Student develops the ability to create standards to judge, to weigh, and to analyze.	Logical consistency and attention to detail.

Measuring the Development of Leadership Skills

with the task of using a computer-assisted-design package (AUTOCAD) to produce a store layout (as well, they were to use LOTUS 1-2-3 to develop a cost justification for their design). As proficiency in the use of the AUTOCAD package requires 250 to 300 hours on the machine, a procedure was developed where a small number of students were taught to use it by the instructor and then given the responsibility of (training other students. These students were selected as team leaders solely based on their having had more previous experience with computers.

After the exercise was completed, the students were administered a communication-style questionnaire, consisting of 20 items. The first tell questions relate to communication style under normal work stress and the second ten to communication style under high work stress. The instrument categorizes respondents into four communication styles: Analyzers (analytical, systematic, methodical, and structured); Affiliators (empathetic, listener, sensitive, willing to assist others); Conceptualizer (innovative, creative, idealistic, visionary, intuitive); and Activator (decisive, direct, assertive, dynamic, impatient, pragmatic).

The findings are very thought provoking: the five student leaders were either Conceptualizers (n=3) or Activators (n=2), while the rest of the class were predominantly Affiliators (n=20), with the other student being an Analyzer. As no pretest was conducted, there is no evidence to confirm that the leadership experience changed the five leaders from Affiliators to Conceptualizers or Activators. However, it is our supposition that they came to the class as Affiliators (as they are more likely to have traditional sex-role orientations as indicated somewhat by their choice of academic major) or Analyzers (they were chosen for the leadership role because of their computer experience). That students may acquire different communication styles through the leadership experience is an extremely positive result. This is not to say that one communication style is better than any other; but, ideally, education can provide students with the ability to look at issues and to communicate issues from different perspectives. If the student leaders were able to learn new communication scripts from this experience, the exercise was indeed successful.

CONCLUSION

The point of this example is that much more emphasis is needed on delineating just what students should be learning. Maybe there is hope for showing that experiential learning approaches do foster greater learning if we can develop measures of the type of learning that experiential exercises are being created to teach. Most research has failed to find that experiential methods foster greater learning than more traditional approaches. Our view is that the weak results are in part due to the weak measures used to capture "learning. We need to specify what we want our students to learn in terms of process, and then specify possible measures of such ‘earning. Further, we need to attempt to assess the nature of the tacit knowledge required for success in the positions for which students are being trained. For example, if they are going to be expected to be self-starters, then we need to assess whether our pedagogies are helping students learn such behaviors.

As professors, we are confronted with large numbers of young students, some of whom lack much motivation initially. If we are to be successful instructors, we need to move them in a positive direction in terms of their developing into successful business executives. They do not need to learn the same things, nor do they all need to receive the same level of guidance. We need to develop first our perception of what behaviors, attitudes, and cognitive structures are required of people entering and eventually succeeding in our field. It is not always clear that we do this systematically. Second, we need to select pedagogies such that the students to whom we are exposed get as much preparation as is feasible. Last, we need to measure whether the students have developed those behaviors, attitudes, and cognitive structures which were deemed appropriate for the field.

To some extent, many of us in ABSEL have been more concerned with the second step than with the other two. However, advocacy of experiential methods probably is indicative of greater than average concern for the first step. As yet, ABSEL members have not indicated adequate concern for the third step. If ABSEL is to contribute to our disciplines significantly, we believe that the third step must be dealt with satisfactorily.

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