Business Games and Experiential Learning in Action, Volume 2, 1975

RESEARCH ON EXPERIENTIAL LEARNING: ENHANCING THE PROCESS

Douglas E. Wolfe
and
Eugene T. Byrne

Southern Methodist University

INTRODUCTION

In recent years there has been a growth in the number of courses based on experiential learning. These courses take many different forms, but live action projects, internships and laboratory-type interpersonal and organizational problem-solving courses seem to predominate the growth.[1]

The growth in experience-based learning has been paralleled by more activity in professional associations devoted to the examination of these teaching methods. The birth of ABSEL, the inclusion of a teaching methodology section in AIDS and the creation of the Center for the Assessment of Experiential Learning at the Educational Testing Service attest to the increasing popularity of experience-based learning.

As with any course, experience-based learning courses require attention to four basic tasks: design, conduct, evaluation and feedback.

The design phase (or "setting the stage") includes the specification of learning objectives; the production or selection of activities for participants; the identification of factors affecting student learning and the creation of a scheme for implementation.

The conduct of the experience involves maintaining and controlling the design. It will include such actions as altering the original timetable and activities and acting to sustain a favorable learning environment.

[1] The authors would suggest that many, if not all courses that utilize business simulations are appropriately classified as forms of experience-based learning. In particular, this applies to courses where a simulation is the predominant activity.

Evaluation includes provision of opportunities for students to articulate and demonstrate specific learning and the creation of data to determine the effectiveness of the design and conduct of the experience.

Feedback, ideally beginning at the outset and continuing until the course is completed, involves monitoring the experience to detect the occurrence of positive and negative features. The faculty member acts to foster positive aspects and eliminate those features that are negative.

These very brief descriptions of the activities associated with experience-based learning suggest that the activities can be usefully dichotomized as structural and process activities. Structural activities specify the what, where and when of student learning.[2] The process activities specify the how of student learning.[3]

In these paragraphs the authors have dichotomized the basic elements of experience-based learning into structural activities and process activities for the purpose of providing a focus for the discussion of research opportunities. We do not, in fact, see this dichotomy as essential or natural since, for example, we consider learning styles and methods for evaluating learning to be intimately related.

An Opportunity

The authors contend that the greatest opportunities for research in experience-based learning lie in the area of process activities. We suggest that the research on experience-based learning has, to date, significantly overemphasized research on the structural aspects. It is appropriate, and necessary, for research to now focus on the process.

[2] They include the learning vehicles (live project, internship, simulation) the activity schedule (hours of work, duties, number of decisions) and evaluation methods (examination, written or oral reports, instructor or company evaluations).

[3] Process activities include identification of factors affecting student learning (learning styles, individual and group leadership styles, academic backgrounds, work experience attitudes) actions to sustain a favorable learning environment (data collection and interventions) and evaluation (data on student perceptions vis-à-vis intended course outcomes).

Overemphasizing research on the structural aspects of experienced-based learning is easy to understand. The popularity of experience-based learning is rather recent and the requirements for this type of learning were not well understood at the outset. The pressing questions were almost all directed toward structural issues and educators responded. In addition, the response was consistent with the training of most educators who are usually typically more proficient and more comfortable in dealing with structure rather than process. Related developments in technology (e.g., the computer) further focused the research on structural issues. Finally, many traditional university reward systems appear to promote structural rather than process activity.

Some educators have attempted to direct attention to the necessity for process research by pointing out deficiencies in educational programs that are predominated by attention to structure.[4]

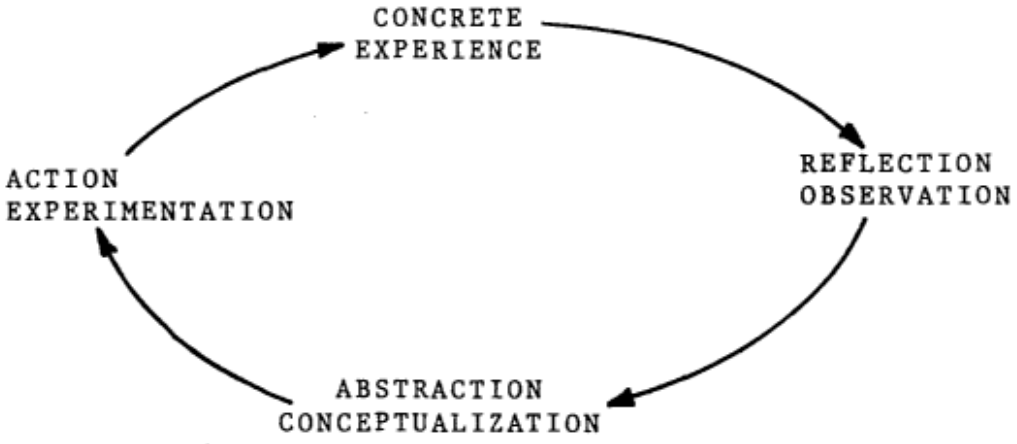
In this paper, the authors will report some results of their investigation into the process and identify some additional avenues for research.

A Conceptual Model of the Learning Process

The research now underway is based on a model of the experiential learning process developed by Kolb, Rubin, and McIntyre (4) and further extended by Kolb (3, 5, and 6). Figure 1 represents this four-phase, cyclical model in which the process of learning through experience is conceived as a repetitive cycle in which the learner first engages in some concrete experience. This leads to reflective observations on that experience from which the learner inductively derives abstract concepts and generalizations. Once formed, these conceptualizations lead deductively to new hypotheses and actions which will test their implications. The new actions or behaviors lead to new concrete experiences which initiate the cycle again.

[4] Livingston (7), Chickering (2), Torbert (12) are notable for their provocativeness.

FIGURE 1
THE LEARNING CYCLE



Drawing from theories of cognitive development, Kolb notes that the cognitive activities and skills required for each phase of the learning process are quite different, involving a substantial shift of cognitive mode from one phase to the next. He asserts that most learners are less than perfect in being able to move readily from one orientation and set of abilities to the next. He goes further to state the hypothesis that ". . .we all as a result of our hereditary equipment, our particular developmental history and the demands of our current environment develop learning styles that are highly individualized." (3, p. 10) Thus, the individual's learning style is a reflection of the relative emphasis placed on each phase of the learning cycle.

Based on this model, Kolb has developed the Learning Style Inventory (4, p.23) to measure individual learning styles. From his work with this instrument he has identified four categories of learning styles, describing characteristic predispositions and patterns of behavior associated with each. These are labeled divergent, assimilative, convergent, and accommodative learning styles.

Enhancing The Learning Process

Given this conceptual model of the learning process and the potential variation of preferred learning styles among the learners, a whole set of questions are raised around

how we might enhance the learning process to increase the learning outcomes. Are there certain learning styles that lend themselves well to certain learning structures or environments? Do preferred learning styles help identify what factors or variables in the learning structure and environment affect learning outcomes for students? To what extent and in what ways does the student's preferred learning style affect the relative significance and motivation he attaches to learning in general or to specified learning objectives? And so on. In each of these questions is an implied search for ways we can act to enhance the learning process.

In our research, one area of emphasis has been on the relative congruence of students' preferred learning styles and the implicit and explicit requirements of the learning environment. We began with the hypothesis that the more congruence there was between the student's preferred learning style and the skills and behaviors inherent in the demands and expectations in the learning environment, the more learning would occur. That is, the more the learner's preferences for placing emphasis on certain phases of the learning cycle matched the inherent emphases or demands in the learning design and environment, the more the student would learn.

Learning Style Congruence and Team Performance In A Simulation Game

The context in which this study was done was a very complex management simulation game.[5] Forty-five students in an MBA program participated in this simulation as a required course designed as an integrative, capstone course focused on the management of the total enterprise.

In this simulation participants are organized into teams of five members each. Each team represents the top executives of a simulated firm, making all of the key decisions required for operation of enterprise. This particular simulation, a third generation adaptation of the CARNEGIE-TECH MANAGEMENT GAME, is sufficiently complex that it requires the active involvement of all team members, up to 310 decisions must be made for each simulated month of operation. In addition, each team reports to a Board of

[5] For a more complete description of this simulation game, see Byrne and Wolfe (1) and Uretsky (13).

Directors comprised of leading members of the local business community, and must relate to a number of environmental institutions represented by actual practitioners fulfilling actual roles as far as possible, such as bankers, underwriters, labor union officials and governmental regulatory agencies. Thus, the requirements for coordinated and integrated action and decision making within each team are quite strong.

As a result, the other members of the learner's team become a particularly important factor in the learning environment. They are both an important source of role and behavioral expectations and an important source of individual student learning. Together as a team they also represent the primary vehicle for performance in the course.

Given this learning structure and design, we transformed our initial hypothesis regarding congruence of learning styles between the learner and the learning environment into the following operational hypothesis:
the more congruence of learning styles among members of a team, the more learning the members will perceive and the stronger the performance of the team.

To test this hypothesis the learning style inventory was administered to each participant. At the end of the semester, the participants also completed a course evaluation questionnaire which included an 18-item, Likert-type scale as a measure of student perceptions of learning. Team performance was determined by a rank order of the nine firms by the two instructors (the authors) using multiple variables from the simulation results, such as share-of-market, return on equity, additions to earnings and equity, stock price, product quality, production capacity and efficiency, and so on.

Congruence of learning styles for members of each student team was calculated first by finding the average learning style for the team. The mean distance of individual member learning styles from the team average was then computed as a relative measure of congruence of team learning styles. The larger the mean distance, the less congruence; the smaller the mean distance, the more congruence.

Table 1 contains the results of this study. As can readily be seen, there is no clear support for the stated hypothesis. There appears to be no relationship between learning style congruence and perceived learning or between learning style congruence and team performance. There does appear to be a relationship between team performance and perceived learning.

TABLE I

Average preferred learning style, learning style congruence, average perceived learning, and performance ranking of student teams in a management simulation game.

Team Performance Rank	Avg. Preferred Learning Style[a]	Learning Style Congruence[b]	Avg. Perceived Learning Score
1	-9.8/-5.6	3.72	81.4
2	-3.0/-5.8	7.00	89.4
3	-2.0/-6.2	8.09	81.8
4	-3.4/-4.2	9.54	82.2
5	-4.8/-4.8	5.52	70.6
6	-7.2/-2.4	4.80	69.8
7	-9.2/-3.8	4.58	59.2
8	-2.2/-2.6	9.14	70.4
9	-7.4/-3.4	4.95	83.4

[a] All of these average team learning style scores reflect a preference for abstract conceptualization and action experimentation phases of the learning cycle.

[b] Higher level of congruence indicated by smaller number.

However, upon closer examination and based on observations of the teams, we were able to observe a crucial cluster of intervening variables related to the group operating style and processes of the various teams. Team #1 had the highest performance, the highest learning style congruence, and reported a high level of learning. This, by itself, would appear to confirm our hypothesis. It is further confirmed when observing their group operating style. Communication was free, open, and purposeful; decisions were consistently based on consensus, and differences were accepted and examined as a basis for improved, more effective decisions; members expressed concern and responsibility for the total operation of the firm while retaining special responsibility for their own functional area. Leadership, although officially vested with the president, was frequently picked up by other members around certain issues. In terms of short-range strategy, their decisions were very effective and successful. While their individual levels of motivation waxed and waned over time, they generally maintained high levels of responsibility and satisfaction. Their sole consternation throughout the simulation was a

running misunderstanding and disagreement with their Board of Directors over long-range objectives and planning.

By contrast, team #2 had nearly equal performances and reported even a higher level of learning, in spite of their considerably lower degree of congruence of learning styles. This team virtually never met as a group. Each member retained responsibility for a specified functional area and set of decisions. Most of the communication took place between a given member and the president, most often by telephone. Contact between members took place directly between them when necessary but usually included the president. Coordination and integration of the team's decisions and actions fell upon the president, who worked long and hard to put the pieces together and did it very effectively. In effect, this team very quickly established a group operating style that provided maximum freedom to members to pursue their own roles and learning in their own diverse styles. They were able to maintain a high level of motivation and responsibility even without much face-to-face group interaction.

Team #9 presents a further contrast. They had a relatively close congruence of learning styles and reported a high level of learning, yet they had the worst performance as a firm by quite a bit. When we examine their group process and a series of events they encountered, it becomes more clear. Although they did not appear to have a particular difficulty at the beginning in working together, their level of motivation and responsibility appeared low. They worked reasonably efficiently but not effectively together. As a result, several unintentional mistakes were made, each compounding the other. Retaining their interest in keeping their time demands to a minimum, they sought to place blame on the "program" and the structure of the simulation and, probably more than we observed, on each other. This led to even more errors or oversights. The firm reached a point of financial crisis, approaching bankruptcy. With the assistance of one of the faculty as process consultant and some hard work, they set out to recover their situation. Their level of motivation and commitment increased substantially and they began to gel as a team. Clearly, the high level of learning is a reflection of their response to an up-ending experience. Their relative congruence of learning styles, which had undoubtedly helped reinforce their earlier ineffectiveness, was turned to an advantage as they worked to survive the crisis.

Similar evidence of the impact of emergent group operating processes on team effectiveness and learning were found with other teams. Unresolved leadership struggles in otherwise congruent teams, efforts to impose a highly interactive consensus-based decision process on a team with very diverse learning styles, autocratic and excluding behavior from the leader of a team whose members had high needs for inclusion and recognition -all of these were observed as constraints to learner performance and to learning.

The implications of these results and observations for enhancing the learning process are numerous. Learning styles, while clearly not predictive of performance and learning, are potentially significant to the learning process. A particularly important cluster of variables relevant to learning and performance within the process are those related to emergent group operating style. Once again, we are reconfirmed that there is no "one best way." All of our usual emphases on consensus decision making, free and open communication, and shared responsibility for the total task are not always the most effective -at least not in the short run of one semester.[6] Other significant variables, such as diversity of learning styles, must be taken into account.

Opportunities for Further Research

The authors have reported on the results of some preliminary research into the relationship between the learning styles of factors in the learning environment and a measure of perceived student learning and team performance.

We feel that the results of this research have enabled us to manage the process element of experience-based learning more productively. In particular, we have been able to eliminate some blocks to student learning and team performance and also to increase the ways in which we can help students articulate their learning. While these efforts are useful they are only a beginning and much remains to be done. Some examples are given in the remainder of this paper.

The impact of iconic as compared to symbolic learning and their effect on learning outcome merits our attention. Professor Harold Leavitt suggested that some of our efforts to understand the learning process could be clarified by including symbolic and iconic

[6] The authors are quite willing to contend that for long- run effectiveness, these patterns of group process are more advantageous.

ways of thinking in our categorization of learning styles. His comments were very provocative but it is not clear, at this point, whether we have adequate measures of students preferences for symbolic and iconic thinking.

More directly, in terms of our own research, there is a strong indication that learning styles can be measured more accurately using behavioral data than by questionnaire. Informal discussion with numerous respondents to the LSI suggest that respondents may be more than marginally successful in producing preferred learning styles that are different than true preferences. This possibly makes the task of utilizing learning styles data, from the current learning style inventory, tenuous since extended discussions with respondents are necessary wherever interventions are needed.

We have also found that some situations are only fully explained by consideration of intervening variables. One variable that is consistently suggested to us in our work with graduate students is what we call the student's orientation toward proving vs. improving competence. We have found it helpful to be watchful of students, especially those with central roles, who appear to be proving their competence. This is especially likely to occur where the student perceives a course as only a graduation requirement. There also seems to be a direct relationship between the occurence of this variable and the amount of work experience. It seems to occur much less in elective type courses. We have yet to find any measure of this variable.

Intervention strategies need to be developed that are appropriate to the unique requirements of all forms of experience based learning. For example, there is a difference between student consultants and host organizations and the consultant-client relationships referred to in organizational behavior literature.

Many experience-based learning opportunities are not as content specific as the more traditional forms of learning. In fact, students usually acquire knowledge or skills outside the intended content area. For example, students working on the design of an information system for an actual company will acquire knowledge about concepts of organizational development. Thus we need to find ways to help students articulate their learning. This articulation is also needed at least as much in the beginning of an experience as it is at the conclusion. In this light it is important to carefully state intended outcomes, however broad they must be, so that students can understand the learning involved in the start-up phase.

These represent a few areas for further research into the process of experience based learning. We think such investigation is essential to the continuing development of this form of learning.

Although we have emphasized some of the opportunities for research into the process we do not want to leave the impression that research into structural aspects are complete. For example, in our own area of complex, computer- based management simulation we await research into the use of real-time systems. The most common forms of complex, competitive simulation models requires that all teams have their decisions processed at a single point in time. A significant addition to structure would involve a model that processed decisions continuously and provided feedback to participants on a continuous basis. Another example would involve the selection of projects for experience based learning. However, we continue to maintain that more attention to issues of process will have very high payoffs to our ability to successfully manage experience based learning.

REFERENCES

1. Byrne, Eugene T. and Douglas E. Wolfe, "The Design, Conduct and Evaluation of a Computerized Management Game as a Form of Experiential Learning," National Conference on Business Gaming and Experiential Learning, April, 1974.

2. Chickering, Arthur, Education and Identity, San Francisco: Jossey-Bass, 1969.

3. Kolb, David A., "Individual Learning Styles and the Learning Process," M.I.T. Sloan School Working Paper No. 535-71, 1971.

4. Kolb, David, Irwin Rubin and James McIntyre, Organizational Psychology: An Experiential Approach, Englewood Cliffs, N.J.: Prentice-Hall, 1971.

5. Kolb, David A., "On Management and the Learning Process," M.I.T. Sloan School Working Paper No. 652-73, March, 1973.

6. Kolb, David A. and Marshall Goldman, "Toward a Typology of Learning Styles and Learning Environments: An Investigation of the Impact of Learning Styles and Discipline Demands on the Academic Performance, Social Adaptation and Career Choices of M.I.T. Seniors," M.I.T. Sloan School Working Paper No. 688-73, December, 1973.

7. Livingston, J. Sterling, "Myth of the Well- Educated Manager," Harvard Business Review, January-February 1971, pp. 79-89.

8. Livingston, Samuel A., et. al., The Hopkins Games Program: Final Report on Seven Years of Research, Baltimore, Md. : The Johns Hopkins University, June, 1973.

9. Mayhew, Lewis B., The Carnegie Commission on Higher Education, San Francisco, Calif.: Josey- Bass Publishers, 1973.

10. McGill, Michael E., "Learning from Administrative Experience," Public Administration Review, November- December 1973, pp. 498-503.

11. Newman, Frank, et. al., Report on Higher Education, Washington, D. C.: U.S. Department of Health, Education and Welfare, Office of Education, March, 1971.

12. Torbert, William R., Learning From Experience: Toward Consciousness, New York: Columbia University Press, 1972.

13. Uretsky, Myron, "The Management Game-An Experiment in Reality", Simulation and Games, Vol. IV, No. 2, June 1973, pp. 221-240.