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What is Happening in Psychology of Learning Courses?

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Current practices in the undergraduate Psychology of Learning course were assessed through a survey in which a questionnaire probing the teaching of the course was sent to 238 4-year colleges and universities in the United States. Fifty-four percent of the questionnaires were returned. Learning courses were taught at all but 10 of the schools that responded. The course typically is one of several that can be selected to fulfill requirements for the major in psychology. The course orientation and content varied widely from cognitive to eclectic to behavioral, and laboratory requirements existed in less than half of the courses. The effects of these practices on behavior analysis are considered and several suggestions are made for teaching behavior analysis in the Learning course and elsewhere to undergraduates.

A positive future for behavior analysis depends on the success of its principles in affecting the theory and practice of psychology. The propagation of these principles depends significantly on the number and quality of psychologists who come to subscribe to a behavior analytic world view. Branch and Malagodi (1981) addressed several problems related to systematic training programs in behavior analysis at the graduate level. Many of their observations can be extended by noting that without undergraduates interested in behavior analysis there will be few graduate students with such interests. Significant reductions in the number of new graduate students ultimately will lead to a decline in systematic training in behavior analysis. Without behavior-analytic training for graduate and undergraduate students, a perilous future for behavior analysis is assured.

Questions about where and how to interest undergraduates in behavior analysis invite consideration. For both historical and didactic reasons, one logical place to introduce behavior analysis systematically to undergraduates, beyond the general survey of psychology offered in introductory courses, is the Psychology of Learning course. Behavior analysis developed in the context of the psychology of learning and many of its principles relate to theoretical issues in learning. Both Keller and Schoenfeld (1950) and Skinner (1953), each of whom pioneered teaching behavior analysis to undergraduates, approached the subject using the psychology of learning as a foundation (cf. Shull, 1984). The opportunity for hands-on experience with behavior analysis through laboratory experiments and demonstrations of learning with living organisms can be a significant and unique experience for many undergraduates. It is in the Psychology of Learning course too that undergraduates are likely to encounter issues of the merits of behavioral and other frameworks for human and animal learning; the relation between basic research and applications of behavior principles; and the relevance of learning principles to other areas of psychology such as clinical psychology (e.g., McDowell, 1982), behavioral ecology and ethology (e.g., Fantino, 1985), behavioral neuroscience (e.g., Iversen & Lattal, in press), and behavioral pharmacology (e.g., Branch, 1984).

Because of the potential significance of the undergraduate Psychology of Learning course to the future of behavior analysis, it was of interest to examine current practices and conceptual orientations in that course. There exist few data to answer questions about what is happening in Psychology of Learning courses. Some

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inferences could be made based on the sales of different learning textbooks, but these data would not reveal actual teaching practices. Therefore, professors who teach the course in colleges and universities in the United States were asked about their courses. In this paper, teaching practices in Psychology of Learning courses as reported by those who teach the course are described first and then these practices are related to the presentation and future of behavior analysis.

METHOD

Two hundred and thirty-eight 4-year colleges and universities in the United States were selected randomly from the alphabetized list of such institutions in *Barron's Profiles of American Colleges* (1986). Every 5th entry was selected with the restriction that the entry had a department of psychology. If the entry had no department of psychology, the next entry was selected and the count to the next selection began from that point. In the fall of 1987, a questionnaire was constructed and mailed to each Psychology Department Chairperson with a cover letter describing the purpose of the survey and requesting that the questionnaire be completed by the person who most recently taught that department's first-level learning course. A pre-stamped envelope was included for the return of the questionnaire to the authors. Three months after the first mailing, a follow-up letter and a second copy of the questionnaire were sent to those departments from whom a reply to the first letter had not been received.

The questionnaire, which can be obtained from the authors, contained 37 questions organized in three areas: General information about the course in the context of the college or university and department, the classroom (lecture) component of the course, and the laboratory component of the course. Most questions could be answered by checking appropriate alternatives; others required a short written response. Additional comments were invited and a copy of the course syllabus was requested.

RESULTS

One hundred and thirty-eight questionnaires were returned from the first and second mailings combined (99 from the first mailing and 39 from the second), an overall return rate of 58%. Of the questionnaires returned, 10 were blank, yielding a usable return rate of 54%. Eight of the blank questionnaires included a cover letter indicating that the course was not offered (two of the responders cited retrenchment as the reason for the non-availability of the course; the others were returned without comment). Eight others described courses labeled as other than the Psychology of Learning (e.g., Experimental Psychology, Behavior Modification, Cognitive Processes). As responders were allowed to define their Psychology of Learning offerings within the general parameters of the cover letter, these eight questionnaires were included in the analysis. Therefore, all of the 128 completed questionnaires were considered usable. Some responders omitted one or more questions but these questionnaires were included in the analysis. The inclusion of these latter data accounts for apparent discrepancies in the total number of responses to each question.

Babbie (1979) considered a response rate of 50% to be "adequate" and a rate of 70% to be "very good." Shaughnessy and Zechmeister considered Babbie's standards to be "demanding in light of the fact that a typical return rate for a mail survey is around 30 percent" (1990, p. 90). By these latter standards, the present return rate of 54% is high for this type of instrument. Babbie's criteria for response rate suggest that the present rate is adequate and that the results should be interpreted conservatively; however, Shaughnessy and Zechmeister's observations suggest that a broader interpretation may be justified.

To further analyze the representativeness of the sample, the sample population (N = 128) was categorized into public versus private, university versus 4-year college, and schools east and west of the Mississippi River. The percentage of schools that returned surveys were

compared to the percentage of surveys mailed out in each of these categories. A chi-square analysis revealed that significantly more public schools returned surveys than did private ones ($\chi^2_{(1)} = 29.23$, $p < .01$); a marginally significantly larger number of schools east of the Mississippi returned surveys ($\chi^2_{(1)} = 3.95$, $p < .05$); and the percentage of universities and four-year colleges returning surveys did not differ significantly ($\chi^2_{(1)} = 2.82$, $p < .10$). A telephone interview with a small sample ($N = 7$) of the schools that did not return the survey revealed that six of the seven had a psychology of learning course. The most common reason proffered for not returning the survey was its length and the time that would have been required to complete it.

Context of the Psychology of Learning Course

An average of 1 of the courses offered by the psychology departments surveyed was a Psychology of Learning course. The course described in the questionnaire typically was offered once a year (112 of the 128 responders to this question operated on the semester as opposed to the quarter system). The course was most often designed primarily for juniors and seniors, but in 33 instances, it was designed for freshmen and sophomores.

The Psychology of Learning course usually was one of several courses that could be selected from a menu by the psychology major, rather than being a course that specifically was required for the major. Seventy-two schools included the Psychology of Learning course as one of several options in a menu, while 44 required the course for the major, and 12 schools offered the course as an elective. In only 4 instances was the Psychology of Learning course reported as a prerequisite for other psychology classes or classes in other disciplines.

Course Orientation and Content

The orientation of 31% of the learning courses was described as eclectic. Nineteen percent, 23% and 23% of the learning courses were described as having, respectively, associationistic behavior theory, cognitive, and behavior analytic orientations. The remaining 4% indicated other orientations, such as bio-behavioral or neurobiological.

The titles of the courses reflected to varying degrees the orientations of the courses described in the survey. The course titles were sorted into nine descriptors. Courses with a compound title (e.g., Learning and Memory) were assigned to each of the appropriate labels (e.g., one count to learning and a second to memory). The percentages were calculated by dividing the number of courses with a given descriptor by the total number of courses (not by the total number of titles). Eighty-nine percent of all the courses had the descriptor "Learning" in the title, 17% had the descriptor "Memory," and 9% the descriptor "Conditioning." Other descriptors were "Motivation" (6%), "Behavior" (5%), "Cognition" (5%), "Experimental" (2%), "Application" (0.8%), and "Thinking" (0.8%).

An average of 47% of the course time was devoted to teaching learning principles, 29% to learning theories, 13% to scientific method, and the remaining 11% to other topics such as the historical/philosophical background of psychological theories and the biological basis of learning. Even though these and subsequent figures are averaged across all learning courses, and therefore may not reflect accurately the offerings in any individual course, taken as a whole the figures describe generally the nature of the Psychology of Learning courses surveyed.

An average of 72% of the course material described basic research in learning and 25% described applications of learning research, with the remainder illustrating the connection between basic and applied research and future research directions for learning. A slightly higher percentage of the research presented in the lecture portion of the course, 54% versus 46%, described learning experiments based on animal research as opposed to that based on research with human subjects. An equal amount of the material was described as being present-

ed in an empirical and a theoretical manner. (Course materials should not be confused with the use of course time described in the preceding paragraph. For example, within the 47% of course time devoted to learning principles, the material could be distributed as described above.)

Fifty-six percent of the responders (N = 72) returned course syllabi with their questionnaires. All but 2 of the syllabi contained an outline; however, the outlines were presented in varying detail. These outlines were examined for additional data about course content and presentation of materials. In 46% of the returned syllabi, the course appeared to be organized around a presentation of principles of learning and memory. In the remaining cases, learning was presented in a historical perspective and the content was organized around classic theories of learning (e.g., Hull, Guthrie, Tolman, and Skinner). Of the 6 courses entitled "Theories of Learning," 2 were organized around principles of learning and 1 of these included a laboratory component. However, it was not possible to assess how the relations between these older theories and more recent developments in learning were portrayed to students.

The most common procedure was to follow the organizational structure of the assigned textbook in order of chapter presentations. Other instructors used more unique presentations by producing their own organization and including reading assignments from several sources for each topic. The inclusion of primary journal articles and edited books comprised of collections of professional journal articles as required readings suggested that some of the instructors devoted a portion of the course to recent developments in learning.

Course Structure and Requirements

All of the responders indicated that their learning courses contained a classroom component but fewer than half reported that the learning course had a laboratory component. In those terms when the course was offered, an average of 1 lecture section and, where it was a part of the course, 2 lab sections were scheduled. The average enrollment in lectures and labs was, respectively, 32 (range: 5–200) and 24 (range: 3–38) students.

The distribution of time among activities during the classroom component was assessed. An average of 77% of the time was spent on lectures, 11% on small-group discussion, 4% on audio-visual presentations, 5% on student presentations, and 3% on other activities such as debates among students and classroom demonstrations by the instructor. Of the syllabi returned, fewer than 28% (20) indicated that the instructor provided specific study or behavioral objectives for the various units in the course. Two courses used the Holland and Skinner (1961) programmed learning text, but none of the syllabi indicated that a personalized system of instruction (PSI) or other teaching technology derived from research in learning was used in the learning courses.

The textbooks used most frequently by the responders to the survey and the percent of responders using each were: Domjan and Burkhard (1986) (12%); Houston (1981) (6%); Klein (1987) (6%); Mazur (1986) (3%); and Schwartz (1984) (3%). In 4 courses, both a basic learning text and a text dealing with behavior modification or other application of learning principles was used. In addition to these textbooks, 85% of the 128 responders indicated that additional readings were assigned, including journal articles (N = 73) either directly from professional journals or from commercially produced compilations of articles, instructor-made handouts (N = 59), and chapters from other books (N = 25). In many cases, more than one type of additional reading was required in a single course.

A large majority of the learning courses reported using 2–4 examinations a term. Only a few used weekly quizzes. Exams in most courses were a mixture of objective and short answer questions. In 66% (85) of the learning courses described, written work other than examinations was required. Term papers were required in

44 of the courses, lab reports in 35, commentaries on assigned readings in 25, research proposals in 18, and short essays or conceptual position papers in 14. Of the courses in which additional written assignments were made, 72 required that students' written work conform to the APA *Publication Manual* (1983). Again, in many cases, more than one type of written work was required.

Laboratory Component

Forty-six percent (58) of the courses required participation in a laboratory component as well as the lecture/classroom activities. Laboratory sections in these courses were scheduled an average of 1 hour twice per week.

The two most frequently reported laboratory activities involved performing experiments and/or completing lab exercises in which learning phenomena were demonstrated. Together these 2 activities accounted for almost half of the laboratory time of the students. Less time, an average of 28%, was reported spent performing original experiments developed by the instructor or by the students themselves or in replicating experiments reported in psychological journals. The least amount of the laboratory time was reported to be devoted to activities such as computer-simulated experiments. Two courses had an optional lab as a part of a list of activities from which students could choose in meeting the course requirements. In 3 instances, a laboratory-type requirement was included but it involved completion of a self-management project in which students selected a behavioral goal for themselves and then implemented and evaluated a plan to achieve the goal. Of this type of project, one enthusiastic respondent noted:

> I've approached the lab side of the learning course in a number of ways (mainly using animals). Using students as their own subjects in a self-management project may teach less about some learning principles but it's the only lab I've ever run where students tell me a year later that they still at least think about it. Some even report that it continues to affect their behavior. Wow.

Laboratory manuals were reported to be used in only 12 of the courses surveyed. Of these, 4 used instructor-designed manuals and the others used commercially produced manuals, notably those of Michael (1963) and Homme and Klaus (1967).

Human subjects and rats were used respectively in 40% and 47% of the laboratory components. Computer simulations (8%), pigeons (4%), and gerbils (<1%) also were used. Generally, 1 subject was studied by every 2 students.

The topic of ethical treatment of human and animal subjects in the learning laboratory component also was addressed. In 40 courses students were exposed to the *APA Ethical Principles in the Conduct of Research with Human Participants* (1973) and in 38 courses the *APA Guidelines for Ethical Conduct in the Care and Use of Animals* (1985) was presented. Thirteen of the course instructors indicated that the APA guidelines concerning the use of animals in research had affected the laboratory component of their learning courses. In 5 instances, the guidelines prompted a reduction in the number of animals used in the course and in 1 instance the guidelines had prompted the elimination of the laboratory component. Other instructors indicated that the guidelines prompted revisions in their laboratory components such as the elimination of experiments using aversive stimuli, the elimination of food/water deprivation, and changes in animal housing and maintenance.

The arrangement of experimental conditions and the collection of data can be either automated or controlled manually. In laboratory sections where experiments were conducted, these functions were performed manually at least some of the time (45 courses). Microcomputer control of experiments was reported in 25 laboratories and electromechanical control of experiments in 23. Self-contained units (e.g., Gerbrands or Davis student laboratory conditioning units) and larger computers (e.g., minicomputers such as the PDP 8) were used in only 5 courses. In most laboratories there was a mix of automated and manual control of experiments and types of equipment used by

students (although by a margin of 79% to 21%, commercial equipment was used over homemade equipment).

The primary type of data analysis in the laboratory component of the course was graphic. Approximately 41% of data analysis was devoted to graphical analysis, while 21% was devoted to computing descriptive statistics and 20% to computing inferential statistics. Fifteen percent of the data analysis involved interpreting cumulative records and other types of data analysis represented the remaining 3%.

Of the courses in which a laboratory was required, 93% required written work, primarily in the form of laboratory reports but also research proposals (8 courses) or term papers (3 courses). Written work was required to follow the APA *Publication Manual* (1983) in the 73% of the laboratory sections where written work was required.

DISCUSSION

The survey results reveal several practices in Psychology of Learning courses that have implications for teaching behavior analysis to undergraduate students. An analysis and discussion of these practices will be followed by some observations about the introduction of behavior analysis to undergraduates.

Practices in the Psychology of Learning Course

All but a few departments completing the survey included a Psychology of Learning course in the undergraduate curriculum; however, relatively few of the learning courses were described as behavior analytic in orientation. Further, only slightly more than half of the departments of psychology represented in the survey require the learning course as part of the psychology major. The infrequent requirement of learning as a requirement for majors and the paucity of behavior analytically oriented learning courses may be influenced by several factors.

The diversity of viewpoints in the course may reflect accurately healthy and productive disagreements within learning. Such diversity also could relate to other variables, for example, the absence of a strong committment to a particular or unified view of learning. Michael (1980) has suggested that a diversity of material offered at the graduate level may crowd behavior analysis out of graduate curricula. A similar situation may be occuring at the undergraduate level in the Psychology of Learning course. That is, behavior analytic material may be abbreviated or eliminated to make room for broader coverage of issues in learning in the course. Further, as Branch and Malagodi noted, there are few "cohesive [behavior analysis] training programs within major Ph.D. granting institutions. With few exceptions ... a single 'token Behaviorist' usually finds him or herself isolated in a department composed of mentalistic psychologists" (1981, p. 36). Therefore, instructors assigned to teach the Psychology of Learning course may not have a background in behavior analysis and, understandably, may opt to teach the course from a perspective congruent with their own. A related factor to consider with respect to course orientation is that, for some instructors, it may be easier to convey learning principles to beginning students by using nonbehavioral descriptions, such as intuitive, anthropomorphic, or cognitive ones, as opposed to precise behavioral description. Undergraduate students may differentially reinforce nonbehavioral descriptions because of their own histories, which may be more likely to involve nonbehavioral accounts of action.

With regard to course structure and content, the results of the survey suggest that many instructors simply reconstruct the table of contents of a selected textbook as their course syllabus. The relatively small number of learning textbooks that are strongly behavior analytic, in turn, may contribute to the small percentage of courses reflecting this orientation. Furthermore, without behaviorally oriented textbooks, some instructors may be unaware of recent developments in the Experimental Analysis of Behavior. The further question of why there are

so few behavioral textbooks arises, which takes one full circle to the issue of the diversity of viewpoints previously discussed. In addition, publishers may encourage broadly based textbooks that appeal to instructors of many different orientations, which may in turn result in greater adoptions and therefore sales.

Another feature of the structure and content of the Psychology of Learning course is the presentation of the application of learning principles. Michael (1980) suggested that such presentations should be proffered circumspectly lest the analysis be superficial. Nonetheless, in many of the learning courses, applications of learning principles played a significant role. Interestingly, the missing application in virtually every course surveyed was to the teaching of learning. Despite extensive discussion by behavior analysts about such applications to college teaching (e.g., Keller, 1968; Skinner, 1968; cf. Bower & Hilgard, 1981, chap. 15) there were almost no examples of systematic applications of learning principles to teaching learning. Among behavior analysts, there are notable exceptions (e.g., Hineline, 1974) but these have not been adopted widely. Because the psychology of Learning course generally is taught once per year and is not a requirement in most of the psychology departments surveyed, instructors may not take the time and effort required to develop learning courses based didactically on behavioral principles.

One important "application" in teaching learning is that of providing laboratory work with living organisms, human or non-human as circumstances permit. From the results of the survey, it appears that the laboratory component of the Psychology of Learning course may be in jeopardy. Fewer than half of the learning courses included a required laboratory even though this course seems especially amenable to laboratory work. Along perhaps with methodology or "general experimental" courses, the learning course offers beginning students the greatest opportunity for hands-on experience in studying behavior. If this separation of course and lab is a trend, it raises general questions about the location and extent to which undergraduates receive experience in systematically observing behavior and conducting simple psychology experiments.

The use of human subjects in the learning laboratory also warrants discussion. Within behavior analysis there is increasing interest in basic research with humans and its relation to empirical and theoretical work with other animals (e.g., Perone, Galizio, & Baron, 1988). The reflection of this emphasis in learning courses is positive; however, there also may be a negative side of the emphasis. Some departments historically may have lacked the resources to provide care and maintenance of laboratory animals, an unfortunate but tolerable reason to not offer experiences in non-human learning to students. On the other hand, animal welfare legislation has increased markedly the cost of using non-human subjects in all types of research and university animal welfare committees routinely challenge teachers of psychology to eliminate or reduce the use of animals in didactic settings. It is reasonable to ask whether the use of non-human animals in student laboratory work is declining. If it is, then the extent that the decline is due to increased costs and administrative pressure to eliminate the use of animals in these laboratories must be considered. These fiscal and administrative obstacles must be countered with effective arguments for cutting costs and for the educational value of using animals to teach learning principles.

The infrequent use of computers to simulate experiments in the learning laboratory course may be viewed positively. Computers are used widely in the control and analysis of learning experiments but few learning courses in the survey reported their use in this manner. Such use of computers in simulation experiments may deprive students the opportunity for direct contact with animal or human behavior in experimental, laboratory settings. As with simulation, the direct observation and recording of behavior by novice investigators may be viewed by instructors as being more valuable than

arranging for computers or other devices to control events in such a way that the students do not interact directly with their subject matter. Human and fiscal costs associated with the development and maintenance of complex control systems for undergraduates may be factors detering their use in the undergraduate learning laboratory.

Introducing Behavior Analysis to Undergraduates

Historically, as noted, the introduction of behavior analysis to undergraduates occurred in the context of the psychology of learning. Although there now are other contexts in which behavior analysis can be introduced, the Psychology of Learning course continues to offer at least two advantages: (1) the context is valuable for instilling the empirical base of the discipline and for contrasting behavioral and other approaches and (2) there is at least the possibility of students having hands-on experience with behavior principles through the learning lab.

The question of how to introduce behavior analysis is more complex because it contains related questions about the balance of theoretical and empirical analyses, the level of detail, the role of applications, and the use of laboratories. Theory and principle need not be different points on a continuum but rather can be introduced concurrently. This seems an especially useful approach in behavior analysis because a consistent theoretical framework underlies all of the principles unlike, for example, animal cognitive approaches where *ad hoc* principles abound. Shull's (1984) suggestion that the first learning course deal with fundamental principles, saving the details, both empirical and theoretical, for a subsequent course or more individualized laboratory work, is consistent with the present analysis.

Another question is one of who might teach the Psychology of Learning course. Any well-trained behavior analyst should be able to teach an introductory-level learning course. Too often departments are organized around structural labels without attention to function. Thus, a "clinical psychologist" or a "developmental psychologist" is pigeon-holed and assigned only courses in his or her "area." This is particularly an issue in smaller departments where the only behavior analyst might be in an area other than learning. Behavior analysts in such positions could provide a valuable service to the discipline by offering to teach the learning course that otherwise either might not be taught or might be taught by a nonbehavior analyst.

A final and more general issue is breadth. A concern with breadth may result from a history of the liberal arts tradition of representing many sides of issues in the curriculum and allowing students considerable freedom to define their own plan of study. Although these considerations are essential in university and college curricula, it is difficult to reach a consensus on how to define breadth and to decide how many viewpoints to represent in a curriculum and to what degree they should be represented. For example, Departments of Biology do not present evolution and creationism as alternative accounts of life nor do Physics Departments present relativity and astrology as alternatives for understanding cosmology. Psychology as a discipline has a less cohesive conceptual framework than physics or biology. As a result, many points of view are represented by the psychology department faculty and in the undergraduate curriculum. In such an environment, however, it is important to insure that empirically oriented psychology courses, such as the learning course, are not squeezed out in the manner described by Michael (1980). Behavior analysis offers a consistent world view for considering problems of human and nonhuman behavior and behavior analysts should welcome educational requirements that expose students to the diversity of problems in psychology. Students well trained in behavior analysis should learn how to approach various problems in psychology and to defend their conceptual base in light of alternative positions. To do so, however, behavior analysis must not be excluded when issues of

breadth arise. Behavior analysts must be sensitive to the issue of breadth and how to assure it while concurrently being vigilant in insuring that behavior analytic topics and courses, in learning or otherwise, are not compromised or supplanted in the guise of providing curriculum breadth.

Recently, some observers have painted a rather guarded picture of the role and future of learning as an area of psychology (e.g., Logue, 1986; Rescorla, 1984). Rather than "go gentle into that good night" (Thomas, 1971, p. 128) those interested in learning, and especially behavior analysts, must rekindle the light. Other observers have been decidedly more optimistic (e.g.,Domjan, 1987; Rashotte, 1988) and within behavior analysis several have commented positively on its future (see Lattal & Harzem, 1984). Although the Psychology of Learning course continues to be a valuable tool for introducing behavior analysis to undergraduate students, several changes might enhance this value. For example, textbooks emphasizing both behavior analytic methods and interpretation of data could be more numerous and general in their coverage of learning (e.g., Catania, 1984). Commercially available contemporary lab manuals describing engaging experiments that take full advantage of methodological advances in experimental techniques and computer technology might facilitate the establishment and extension of learning labs. In addition, a forum for systematically communicating teaching practices in the learning course might enhance the utility of the learning course as a tool for introducing behavior analysis. This might be achieved through such things as a special interest group within The Association for Behavior Analysis or through the development of a subsection of the Behavioral Bulletin Board (Mallott, 1989). More learning courses taught from a behavior analytic perspective just might, simply as a function of numbers, influence more undergraduate students to pursue graduate training in some area of behavior analysis. More likely, and also of importance, such learning courses will help ensure that behavior analysis is represented at least equally with other contemporary approaches in psychology. Indeed, many of the alarming misconceptions behavior analysis reported in the general psychological literature (e.g., Kimble, 1989; Mahoney, 1989) are derived directly from issues in learning and are best addressed in that context. In conclusion, not only has the content of the psychology of learning course played an important role in the history of behavior analysis, but a positive future for the discipline also seems better assured when its adherents can answer for themselves the question of "what is happening in Psychology of Learning courses?"

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