

## DOCUMENT RESUME

ED 453 435

CE 081 859

TITLE Professional Development. Symposium 26. [AHRD Conference, 2001].

PUB DATE 2001-00-00

NOTE 25p.; In: Academy of Human Resource Development (AHRD) Conference Proceedings (Tulsa, Oklahoma, February 28-March 4, 2001). Volumes 1 and 2; see CE 081 829.

PUB TYPE Collected Works - General (020) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS Critical Thinking; \*Educational Practices; Educational Research; Educational Strategies; \*Educational Theories; Experiential Learning; Foreign Countries; Goal Orientation; Human Resources; Information Technology; \*Labor Force Development; Learning Processes; Learning Theories; Literature Reviews; Postsecondary Education; Problem Based Learning; Problem Solving; \*Professional Continuing Education; \*Professional Development; Reflective Teaching; Research Design; \*Theory Practice Relationship; Training Methods

IDENTIFIERS \*Situated Learning; United Kingdom; United States

## ABSTRACT

This document contains three papers on professional development. "An Inquiry into the Continuing Professional Education of Information Technology Workers" (David D. Branigan) reports on a study in which the model of the critically reflective teacher was used to examine the practice of continuing education for the information technology profession. A set of assumptions about developers, instructors, and learners was formulated and analyzed for their alignment with similar concepts rooted in the literature and through interviews with developers, instructors, and learners. Finally, educational criticism and connoisseurship was used to provide a description of current practice. "The Relationship between Professional Learning and Continuing Professional Development in the UK: The Implications for a Research Design" (Jean Woodall, Stephen Gourlay) provides a critical review of theories of professionals' learning processes and the ways in which they manage their learning when in professional practice. "A Comparative Analysis of Problem-Based Approaches to Professional Development" (Margaret C. Lohman) presents the results of a literature review of the following problem-based approaches to professional development: case study; goal-based scenario; problem-based learning; and action learning. Key differences in the nature of the case problems and training strategies used in the approaches were identified and shown to result in different training outcomes. All three papers include substantial bibliographies. (MN)

# 2001 AHRD Conference

## Professional Development

PERMISSION TO REPRODUCE AND  
DISSEMINATE THIS MATERIAL HAS  
BEEN GRANTED BY

*Branigan/Woodall*  
*Lohman*

TO THE EDUCATIONAL RESOURCES  
INFORMATION CENTER (ERIC)

1

### Symposium 26

U.S. DEPARTMENT OF EDUCATION  
Office of Educational Research and Improvement  
EDUCATIONAL RESOURCES INFORMATION  
CENTER (ERIC)

This document has been reproduced as  
received from the person or organization  
originating it.

Minor changes have been made to  
improve reproduction quality.

• Points of view or opinions stated in this  
document do not necessarily represent  
official OERI position or policy.

### Tulsa, Oklahoma

### February 28 - March 4, 2001

BEST COPY AVAILABLE

# **An Inquiry into the Continuing Professional Education of Information Technology Workers**

*David D. Branigan  
DeVry Institute of Technology*

*This study examined the practice of continuing education for the information technology profession using the model of the critically reflective teacher. A critical reflection of this author's practice resulted in a set of assumptions about developers, instructors and learners. These assumptions were examined for their alignment with similar concepts rooted in the literature and through interviews with developers, instructors and learners. Educational criticism and connoisseurship was then used to provide a description of current practice.*

**Keywords:** Continuing Professional Education, Information Technology, Critical Reflection

Since the introduction of the computer in the 1940s information technology (IT) has been growing at an astonishing rate. Corporations rely on the storage and analysis of data to make decisions that directly affect their business. The men and women who install the computers, keep them running, and write the software necessary to facilitate the storage and analysis of data are the IT professionals.

Computer systems are continually evolving. Information technology professionals must keep up with the emerging trends in technology. This requires continuing professional education. The men and women who design and deliver this education provide an important role in the success of information technology. Designers and developers of continuing education for the information technology profession are responsible for the continuing success of the information technology profession. However, many of these developers and instructors become educators of information technology professionals without prior experience in adult education, adult learning, or course design. They are given minimal formal training in how to do their jobs. They do what they do by modeling the actions of other developers and instructors.

This research will help developers and teachers of continuing professional education for information technology workers reflect on their practice and provide more meaningful continuing education experiences for the information technology professional. Through a process of inquiry, much like the process undertaken in this dissertation, developers and instructors will come to see themselves more as continuing professional educators. In this way they will create the new idea, policy or strategy of action noted by Houle (1980). The new idea will be that they are educators first and subject matter experts second. The new policy will be that they will become facilitators of learning. The new strategy of action will be to seek out training in adult education and learning how to learn as a means to this end.

## **Problem Statement**

The process of continuing education of IT professionals is about the lifelong learning and education of adults. This process involves three parties: developers of education for IT professionals, instructors of IT professionals, and IT professionals as learners. Although studies have been conducted involving each one of these parties no study involving all three parties has been conducted in examining the continuing education of IT professionals. Understanding the roles of these three parties in the process is an important first step in the improvement of the continuing education of IT professionals.

## **Theoretical Framework**

Houle (1980), in his comprehensive work on continuing professional education, defined three modes of learning used by professionals: inquiry, instruction, and performance. Inquiry is the creating of a new synthesis, idea, technique, policy or strategy of action. Inquiry is a form of critical reflection where professionals must explore a new theory or method to identify its essential nature and explore the consequences of its application.

*Copyright © 2001 David D. Branigan*

Professionals build a repertoire of professional behavior through practice. Professionals often do not know why they do the things they do (Schön, 1983, 1987). The professional must become a reflective practitioner, one who undertakes thinking in action. This requires critical reflection on practice on the part of the professional.

There is also a necessity for the critical viewpoint in continuing professional education (Cervero, 1988). Continuing professional educators must do more than merely understand the technical aspects of their work. To become a critically reflective educator one must explore one's practice. This exploration must take place not only through one's own eyes but also through the eyes of others. The critically reflective educator explores practice through his or her own eyes, the eyes of one's peers, the eyes of one's students, and the literature on educational practice (Brookfield, 1995). The educator must examine his or her assumptions about the educational process.

The research performed for this dissertation used educational criticism and connoisseurship (Eisner, 1975) to explore the practice of continuing professional education for information technology workers. The result was a criticism of the continuing professional education of information technology workers. Through exploration of this author's practice, the literature, and interviews with developers, instructors and information technology professionals this research offered insight into the current practice of continuing professional education for information technology workers.

### **Research Questions**

The following question concerning the continuing professional education of information technology workers guided this study:

What implications for theory and practice would result from critical examination through personal reflection on practice, a review of the literature and interviews with practitioners and learners?

Through this author's reflection on his practice the following assumptions were developed which guided the examination of the literature and interviews with developers, instructors and learners.

#### *Assumptions about Developers of Continuing Education for Information Technology Professionals*

1. Developers had little previous expertise or training in course development. They were subject matter experts or instructors who became developers out of need.
2. Developers were given minimal formal training in course development or instructional systems design. What expertise they had in development was obtained through their personal experiences or through other developers like themselves.
3. Developers followed no formal course development process. They developed courses because they saw a need. Content for courses came from their own experience in the subject or from other courses they had experienced.
4. Developers followed no formal evaluation process. Courses were deemed successful if the learners accepted those courses.

#### *Assumptions about Instructors of Continuing Education for Information Technology Professionals*

1. Instructors were hired for their subject matter expertise and had minimal formal training in adult education.
2. Instructors had been given little formal training in adult education or teaching since being hired. What expertise in adult education that instructors had acquired was through experience in what worked and what did not work in their teaching of courses. Instructors did their jobs the way they did because that was what they had seen other instructors do and their students accepted it.
3. Instructors evaluated their effectiveness and success based on the acceptance of their students and not on the learning that took place in their classrooms.

#### *Assumptions about Information Technology Professionals as Learners*

1. Information technology professionals had a wealth of learning experiences other than formal learning experiences.
2. Information technology professionals learned much from their peers.
3. Information technology professionals based the success of their learning experiences on the ability to turn

that learning into practice.

## Methodology

This study examined the practices of continuing education for the information technology profession using the model of the critically reflective teacher (Brookfield, 1995). Brookfield refers to the first step in this process as a search for assumptions. The educator must examine his or her practice critically and develop assumptions about that practice. These assumptions are then examined for their alignment with similar concepts rooted in the literature. Other educators are consulted with to help shed more light on our practice. Learners are then interviewed to help us see ourselves as learners see us.

This study began by looking at continuing professional education in the information technology profession through the eyes of one who had spent 16 years developing and delivering courses to information technology professionals and who had taken continuing education courses as an information technology professional. This critical reflection resulted in a set of assumptions, as listed above, about developers, instructors and learners. These assumptions were then examined for their alignment with similar concepts rooted in the literature. The literature bases of continuing professional education, program development and instructional systems design, adult education, and learning how to learn were examined. Interviews with developers, instructors and information technology professionals were then conducted.

Educational criticism and connoisseurship (Eisner, 1975) was then used to provide a criticism of the continuing professional education of information technology workers. Eisner developed educational criticism and connoisseurship to enable the reflective practitioner to write a criticism of educational practice in order to enlighten other educators. Educational criticism and connoisseurship developed as a method of evaluating art curriculum. It has since been used in the evaluation of curriculum materials (Vallance, 1975), to examine the implementation of a non-graded primary program (McGee, 1993) and to explore the development of a system of teacher evaluation and supervision (Rodli, 1994). The research performed for this dissertation used educational criticism and connoisseurship to explore the practice of continuing professional education for information technology workers.

This study was limited in several ways. This study pertained to the technical training of information technology professionals. A limited number of interviews were conducted. This study did not attempt to assess differences between developers, teachers, and learners from different environments. Instead, each group - developers, teachers, and learners - was treated as being a homogeneous group.

All subjects either lived in the Chicago area or worked for companies in the Chicago area. No attempt was made to assess differences across geographic boundaries.

All developers conducted development for companies for which they worked and primarily for employees within those companies. No attempt was made to assess differences based upon whether developers created educational experiences for customers of hardware/software vendors, customers of training consulting firms, internal corporate use, or as independent training consultants.

## Results

Based upon the findings of this study the following conclusions were reached relative to the assumptions about developers, instructors and learners.

### *Developers of Continuing Professional Education for Information Technology Workers*

*Assumption 1: Developers had little previous expertise or training in course development. They were subject matter experts or instructors who became developers out of need.*

This study found that developers of courses for information technology professionals began their jobs out of necessity. They saw the need for educating their colleagues and took on the challenge or they were put in the position of developing courses because of their expertise in the subject.

They had little development expertise. They were not formally educated or trained in program or course development or the instructional design process. They had not been formally educated or trained in adult learning or learning how to learn. They were subject matter experts. Any development expertise they had was self-taught. They had knowledge of the subject, had developed writing skills, and had a feel for the topic.

*Assumption 2: Developers were given minimal formal training in course development or instructional systems design. Development expertise was obtained through their personal experiences or through other developers like themselves.*

It was found that developers did their job the way they did because it was the easiest way for them to do it. It was the quickest way to get the job done. It was the way they had seen the job done by others and now they were repeating what those others had done. The assumption was that if this process had worked for others it should work for them. There was little thought or reflection given as to whether it was actually the right or wrong way to do the job. If others did it that way and it seemed to work then it must be the right way.

Through trial and error developers learned to develop better and better materials in their view. As they developed more and more courses they learned what worked and what did not work. As they developed courses for different audiences they learned to structure them to fit the audience.

*Assumption 3: Developers followed no formal course development process. They developed courses because they saw a need. Content for courses came from their own experience in the subject or from other courses they had experienced.*

The findings of this study show that the starting point for a development project was a new product, skill, or standard that needed to be disseminated. The skills of the developers' colleagues needed to be enhanced to make those colleagues better at their jobs, to insure quality, or to help those colleagues advance. The company may have taken on a new direction causing a knowledge gap that needed to be filled due to new technology resources being introduced into the environment.

The content for courses did not come from some rigorous analysis of needs. Rather, it was the developers' own knowledge of the product that dictated the content of a course. In the end it was the developers' own knowledge and experience that led them to assume what those taking their courses would need to know.

There were few objectives. The developers assumed they knew what had to be learned and put that material into the courses. Sequencing was performed intuitively by the developers. As subject matter experts who had learned the products themselves they copied the sequencing they had gone through to learn the product.

*Assumption 4: Developers followed no formal evaluation process. Courses were deemed successful if the learners accepted those courses.*

This study found that developers employed several techniques to checkpoint the development process. Materials were given to another subject matter expert or manager to review. Often, the courses were taught to students to determine the value of the materials. Mistakes or failures were evaluated and materials were changed as needed. This was the type of formative evaluation employed by the developers. The "on the fly" nature of the course development often did not allow for more formal methods of evaluation.

Formative evaluation was done on live students. These were not test classes but the real thing. Several times this resulted in disaster as people were taught things that were not true. If problems did arise as the result of using the materials they were corrected.

There was no formal summative evaluation of the courses. If students were happy, if there were no errors, or if students could do the job after the courses were completed the courses were deemed successful. If students kept coming back to ask unanswered questions or if they could not perform on the job the courses were deemed failures.

#### *Instructors of Continuing Professional Education for Information Technology Workers*

*Assumption 1: Instructors were hired for their subject matter expertise and had minimal formal training in adult education.*

Employers would probably like to think that they hired instructors for the combination of technical expertise and teaching background that they had. The findings of this study tell a different story. Some instructors worked in the information technology field for years before they became instructors. Others were hired straight out of college having obtained degrees in computer science. Still others had minimal technical skills when they were hired. New technical skills had to be developed on the job and on their own time amid the hustle and bustle of their often-hectic teaching schedules.

Instructors' teaching qualifications varied. Some had degrees in education, had student taught as part of their



degree program, but had not actually been in front of a classroom since graduation. Others had technical degrees, had worked as teaching assistants in college, but had no formal training in education. Others had technical degrees, had been working in the information technology field, and had been forced into service training their peers. Still others, with technical degrees and limited experience as teaching assistants, were hired directly out of college.

*Assumption 2: Instructors had been given little formal training in adult education or teaching since being hired. What expertise in adult education that instructors had acquired was through experience in what worked and what did not work in their teaching of courses. Instructors did their jobs the way they did because that was what they had seen other instructors do and their students accepted it.*

Through this study it was found that many instructors developed their teaching skills on the job. If they were lucky they had employers who put them through train the trainer programs. Some programs taught adult education theory. Some instructors had to co-teach with more experienced instructors before they were allowed to teach on their own. Some were video taped so they could observe themselves and make corrections to their styles. Some were assigned a mentor, a senior instructor, who helped them prepare for their roles as instructors.

Other instructors had to learn to teach on their own. They came into teaching thinking that all they needed to know was the technical subject. They learned that this just was not so. There were issues of classroom management and annoying habits to overcome. They had to learn that teaching was not just standing in front of a group and lecturing. They had to learn to employ other strategies in their teaching.

*Assumption 3: Instructors evaluated their effectiveness and success based on the acceptance of their students and not on the learning that took place in their classrooms.*

How could you evaluate the effectiveness of a class? In an ideal world, students would be tested according to the outcomes expected from the course objectives. The results of this study showed that in the real world, after a five-day whirlwind tour of an extremely technical subject, students were handed an evaluation sheet. This evaluation sheet measured the students' pleasure with regard to the class. This said nothing about what they knew about the subject after having taken the class.

It would have been nice to have some sort of follow up. If students could have been contacted months after having taken the course and asked how the course helped them accomplish the job it would have been possible for instructors to know whether their efforts had been successful. This did not happen.

So instructors had devised their own means of evaluating the learning that went on in their classes. Observation, mini reviews and questioning students were used. Workshops or labs were also powerful tools to evaluate student progress. If the workshops were structured so that students were given a chance to use the material soon after it had been discussed, the instructor could gauge the students' learning by how well they did in the workshop.

#### *Information Technology Professionals as Learners*

*Assumption 1: Information technology professionals had a wealth of learning experiences other than formal learning experiences.*

This study showed that information technology professionals had a wealth of learning experiences other than formal learning experiences. Not all information technology professionals started out with a career in information technology as their goal. The four subjects interviewed for this study all began their information technology careers in different ways. Each had different sets of skills when they began. Each became involved in information technology in different ways. Each worked their way up the ranks learning as they went.

The types of learning experiences they had were also varied. In some cases the knowledge they gained was self-taught. Conferences and seminars were also utilized as learning experiences. Video training proved important for visual learners. Some learners used in-house training classes. Formal college classes were used. Every learner in this study had some sort of vendor training or external training course. Hands-on activities were provided as part of the training experience.

*Assumption 2: Information technology professionals learned much from their peers.*

It was shown through this study that peer interaction proved a good way of enhancing one's technical skills.

Interactions took place both with co-workers within ones' own company as well as with contacts made outside the company. A variety of methods were employed in peer learning including brainstorming, meeting with group of peers, asking questions of colleagues and asking consultants working at other companies to share their opinions.

*Assumption 3: Information technology professionals based the success of their learning experiences on the ability to turn that learning into practice.*

The learners in this study measured their success in learning in terms of having confidence and being able to achieve. A learning event was seen as successful if it proved a good basis for learning other things. If one could go away from a learning event with the confidence to try other things with the technology then the event was a success. Even if it just meant learning one new thing that one thing could be used as a starting point for learning more.

If one could see what needed to be done, actually do it, and produce the desired result then learning took place. The learner was now self-sufficient they had achieved their goals. There was a pride that came with this self-sufficiency. You wanted to show someone what you had done with the technology. Success may have been the first time the learner created a database, was able to take two servers out of production and get them working again for the first time, put together a successful project plan, or merely work better with other people.

### **Conclusions and Recommendations**

The parallels between this author's assumptions about the practice of continuing professional education for the IT profession and the results of interviews with practitioners and learners painted the following picture. Changes in technology caused a need for new skills. A developer was given the task of coming up with a course that taught those skills. Using his or her expertise, developed by having taken a similar course and by experimentation with those skills, the developer decided what needed to be taught. A course was written. Lecture notes and workshop instructions were prepared. The course was ready to be taught.

A manager in information technology saw a need for one or more of his employees to learn new technical skills. The manager passed this request on to a training coordinator or some human resources person. The training coordinator called a sales representative from a training firm and bought a course or some seats in a course. The information about the course was filtered back down to the information technology employee on one side and to the instructor on the other.

On the first day of the class the learner, instructor and developer's product came into contact for the first time. In the interim, layers of communications had formed between manager and training coordinator, training coordinator and sales representative, training coordinator and manager, manager and employee, and sales representative and instructor. It was not surprising that information about the course was misinterpreted or not transmitted.

The developer had no training in designing courses. The process that was followed consisted of copying the course content of some similar course and adapting it for a particular situation. In all likelihood the course the developer had taken on the subject was designed in the same way.

In the classroom, it was up to the instructor to convey the need for the subject to his or her students and to apply the appropriate instructional strategies. But instructors had no training on how to do these things. So, they did what they had seen other instructors do or what seemed to work for them. But what if these other instructors had developed their strategies in the same manner?

The learners were being sent to training to learn new skills. As adults they were self-directed learners but they were being thrust into a situation where their learning would be controlled for the length of the course. But controlled by whom? Controlled by a course that was not developed using sound principles being taught by an instructor not trained in the teaching of adults.

At the end of the course the learner, the instructor and the developer had no idea of whether the course achieved its goal. It would be several months before learners knew if the course had given them the ability to turn those skills into practice. The instructor would not learn of the learners' success except by accidental contact. The developer might never know unless he or she worked for the same company for which the course was developed.

Developers should have been trained in instructional systems design and adult program development so they would know the importance of following a development process. Needs assessment, development of objectives, decisions about instructional strategies and evaluation plans would increase the likelihood that their courses would be successful. An understanding of learning how to learn would help them make decisions about which instructional strategies would benefit learners most.

Instructors should have been trained in adult education and learning how to learn. This would have helped instructors understand that adult learners needed to know why they needed to know. It would have helped



instructors employ learning strategies that would best serve their students. By developing and using evaluation strategies in their classrooms, instructors would have been able to better evaluate the success of their students.

Learners would have benefited from training in learning how to learn. Learners employed a variety of learning strategies. Some of those strategies worked and some did not. By understanding what strategies worked best for them and how to make best use of the learning resources available to them learners would have made better use of those resources.

Employing a learning how to learn model for the continuing professional education of information technology workers would have had several benefits. Developers would have developed courses around a variety of instructional strategies designed to facilitate the transfer of skills to the learners. Instructors would have understood the nature of the learners in front of them and how to employ strategies that best served those learners. Learners would have been better prepared to use the resources available to them.

### **Contribution to HRD**

There has been very little research on the process of continuing professional education of information technology workers. Further study will help to build knowledge in the field and improve the practices of developers and instructors with the ultimate goal of improving the quality of learning for information technology professionals. This research will help developers and teachers of continuing professional education for information technology workers reflect on their practice and provide more meaningful continuing education experiences for the information technology professional.

Through a process of inquiry, much like the process undertaken in this dissertation, developers and instructors will come to see themselves more as continuing professional educators. In this way they will create the new idea, policy or strategy of action noted by Houle (1980). The new idea will be that they are educators first and subject matter experts second. The new policy will be that they will become facilitators of learning. The new strategy of action will be to seek out training in adult education and learning how to learn as a means to this end.

### **References**

- Brookfield, S. D. (1995). Becoming a critically reflective teacher. San Francisco, CA: Jossey-Bass.
- Cervero, R. M. (1988). Effective continuing education for professionals. San Francisco, CA: Jossey-Bass.
- Eisner, E. W. (1975). The perceptive eye: Toward the reformation of educational evaluation. Stanford, CA: Stanford University, Stanford Evaluation Consortium. (ERIC Document Reproduction Services No. ED 128 408)
- Houle, C. O. (1980). Continuing learning in the professions. San Francisco, CA: Jossey-Bass.
- McGee, C. D. (1993). Development of social responsibility and student ownership of the educational process: The eighth attribute critical to the Kentucky education reform act primary program (Doctoral dissertation, University of Louisville, 1993). Dissertation Abstracts International, 55, 0218A.
- Rodli, A. T. (1994). Teacher evaluation for professional development: An educational criticism of a reform process (Doctoral dissertation, University of California at Berkeley, 1994). Dissertation Abstracts International, 55, 2672A.
- Schön, D. A. (1983). The reflective practitioner: How professionals think in action. New York: Basic Books.
- Schön, D. A. (1987). Educating the reflective practitioner: Toward a new design for teaching and learning in the professions. San Francisco, CA: Jossey-Bass.
- Vallance, E. J. (1975). Aesthetic criticism and curriculum description (Doctoral dissertation, Stanford University, 1975). Dissertation Abstracts International, 36, 5795A.

## **The Relationship between Professional Learning and Continuing Professional Development in the UK: The Implications for a Research Design**

*Jean Woodall  
Stephen Gourlay  
Kingston University, UK*

*This paper provides a critical review of theories of professionals' learning processes and the ways in which they manage their learning when in professional practice. It does this firstly by examining developments in the context of business professional practice, and then secondly by revisiting current assumptions about professional learning. It then moves on to engage with current debates within socio-cultural theory and situated learning and cognition, before concluding with a discussion of key research questions.*

**Keywords:** Business Professionals, Situated Learning

This paper seeks to critically review theories of professionals' learning processes and the ways in which they manage their learning when in professional practice. The focus upon professionals occurs because, along with other high performance knowledge workers, they are the fastest growing group in the UK workforce, and within this category, the growth in the number of business professionals is particularly marked. However, in examining the pressures for this group to engage in continuing professional development (CPD) it becomes immediately obvious that implicit assumptions about professional learning, and the learning contexts and processes in which business professionals might participate lie uneasily beside the conditions of business professional practice. This paper addresses this issue firstly by examining developments in the context of business professional practice, and then secondly by revisiting current assumptions about professional learning. It then moves on to engage with current debates within socio-cultural theory and situated learning and cognition, before finally concluding with a discussion of key research questions.

### **Theoretical Framework**

Continuing Professional Development (CPD) has been defined as: 'The maintenance and enhancement of the knowledge, expertise and competence of professionals throughout their careers, according to a plan formulated with regard to the needs of the professional, their employer, and society' (Madden & Mitchell, 1993). It has been presented as having three main functions: updating knowledge and skills on existing and new areas of practice; preparation for a changing role in the organisation, new responsibilities and promotion; increasing competence in a wider context with benefits to both professional and personal roles. However, this rather unproblematic definition does not address the importance of the context of professional practice. Neither do theories of adult and professional learning consider whether learning is context specific, and therefore different according to professional body membership and site of professional practice. At the same time questions arise about the way in which professional knowledge and expertise are conceptualised, and in particular, the prevalence of an individually-driven, cognitive, problem-solving focus in learning theory. The theoretical framework for this paper is developed by addressing four propositions.

*Proposition 1: A Consideration of Developments in the Context of Business Professional Practice is Essential to Researching Professional Learning and CPD*

Research into the sociology of professions has a long history, and, at the risk of simplifying a very rich debate, the main research questions have moved beyond defining and comparing the 'traits' of various professions, towards exploring the differences in the history, development, culture, and types of professional work (the processes

*Copyright ©2001 Jean Woodall and Stephen Gourlay*

of professionalisation) and the perceived fluctuations in professional 'power' and 'status' relative to other employee groups. The process of professionalisation can thus be seen as a battle for occupational closure and jurisdiction between different professional bodies (Abbott, 1988; Witz, 1992). Yet a Weberian preoccupation with the relationship between management and professional workers still persists in the assumption that there is more that unites the increasing numbers and types of professionals than divides them. However, while common features of professionalism and professionalisation may still be traced, the distinctive contextual developments are of more interest when looking at CPD. Fragmentation and the appearance of specialist interest groups, the emergence of new professional associations, and changes in membership profiles to include more young women and ethnic minorities and those on flexible contracts, are all characteristics of professional occupations in the field of business management in the UK where there has been a spectacular growth in professional employment over the last twenty years. Existing professional bodies in accountancy, personnel management and the law have consolidated their professional power and status (Armstrong, 1993; Hanlon, 1997; Hanlon & Shapland, 1997), while elsewhere, as in marketing, professional bodies are still in the process of mapping out the professional territory.

Within business management the conduct of professional practice has not remained static. The growing demand for professional work has been accompanied by changes in the professional division of labour, the location of professional work, the content of professional skills and the relationship between professionals and clients (Watkins, 1999). To start with the changes in the division of labour, these have accompanied increasing price competition and globalisation, and developments in new technology. On the one hand they have led to the growth of para-professional roles in fields such as accountancy and legal practice, thereby enabling the delegation of routine work such as company audit or conveyancing of property, and on the other to specialisation based upon firm size, type of work done, source of revenue, and client size. In the case of accountancy, business-driven pressures from the 'Big Five' firms in the UK have placed demands upon the main professional bodies for changes in the curriculum of initial professional development and CPD, which creates tension between meeting these new challenges of specialization while retaining the core identity of the professional knowledge base (Hoskins & Anderson-Gough, 2000). In addition, the growth of the professional services firm which provides multiple professional services has added further diversity to both the content, and the location of professional practice away from individual partnerships (especially in law and accountancy) or specialist units in corporate organisations, to a growth in specialist consultancies (such as in personnel management and marketing). In many cases this has been accompanied by a broadening of individual professional skill bases into other areas of business practice, and especially wider commercial and interpersonal skills (Hanlon, 1997; Hanlon & Shapland, 1997). Finally, public policy pressure for accountability to the public and clients, and quality assurance have resulted in efforts to demonstrate a greater transparency of professional transactions.

It is at this juncture that CPD becomes an important issue. Its significance has grown in association with the pressure for growing regulation, accountability and quality assurance of professional practice, and as a means for enhancing professional status. In particular, regulatory and quality assurance criteria (especially the 1991 UK Governance Regulations on Company Audit), appear to be a very significant stimulus for CPD in the UK accountancy professions, (Woodall, 2000). In contrast other professional bodies such as the Chartered Institute of Marketing and the Chartered Institute of Personnel and Development, have had formal but voluntary policies since the mid 1990s and tend to promote CPD in terms of lifelong learning which is more broadly conceived as including self-development and career development (which is endorsed to a certain extent by two of the finance professional bodies - The Chartered Institute of Secretaries and Administrators - ICSA - and The Association of Chartered Certified Accountants - ACCA).

However, when it comes to what is acceptable CPD activity among UK business professions, then, professional body policies display some common general trends such as the development of obligatory (and sometimes mandatory) structured CPD frameworks, the requirement for individual members to produce evidence of learning and CPD plans increasingly based on learning outcomes and competencies, rather than inputs (especially the Chartered Institute of Personnel and Development, the Institute of Chartered Secretaries, and the Chartered Institute of Marketing), and the provision of more individual support and guidance. Yet, business professional bodies can differ considerably in these respects. Some have moved to competence schemes (The Institute of Chartered Secretaries and Administrators - ICSA) and all the accountancy bodies not only have 'mandatory' CPD schemes which define what constitutes acceptable 'structured' CPD activities, for those who wish to retain their license to practice, but also prescribe preferred providers of these. The Chartered Institute of Personnel and Development (CIPD) appears to be unique in avoiding specification of preferred provision of CPD activity, and along with the Chartered Institute of Management Accountants (CIMA) and the Chartered Institute of Marketing (CIM) are

alone in emphasizing self-directed learning, and learning from work-place activities. This is in marked contrast to the Institute of Chartered Accountants for England and Wales which has rejected these measures, excluding activities that relate to 'normal working activities' from contributing to CPD.

Overall then, professional body CPD policies give little consideration to current thinking around managerial and professional learning. The accountancy bodies place particular emphasis upon professional course attendance, and possibly because they run short course units that earn considerable revenue, they have an ambivalent attitude towards the role of higher education within CPD. Also, while lip service is given to self-directed learning (Sadler-Smith & Badger, 1998) there is evidence that conflict between individual cognitive style and learning preferences might impede its take-up (Sadler-Smith et.al, 2000). There is evidence that professionals who are members of the CIPD may well support the principles of lifelong learning, and prefer job-related learning opportunities, and informal self-directed development, but strongly dislike formal monitoring and recording requirements (Jones & Fear, 1994; Sadler-Smith & Badger, 1998). Also, work-based learning is conceived of as occurring in an individually driven manner, with little recognition of the potential for social learning. There is glancing reference to the power of secondments and shadowing (CIMA) and mentoring (CIM), and some encouragement for peer mentoring and the creation of smaller networks and learning sets (CIPD).

*Proposition 2: Conventional Theories of Professional Expertise and Learning, and Managerial and Adult Learning are Contradictory and Inconclusive*

As already stated, the current state of theory in this field is complicated by the distinction between professionals and managers. In as much as the dichotomy between managerial and professional work has been eroded by the increasing professionalisation of management, there is a strong argument for viewing both groups as examples of knowledge workers operating in similar contexts, and where their learning processes will be similar. This raises three major issues.

First, any discussion of professional learning becomes embroiled in a debate about the nature of professional expertise. Traditional cognitivist accounts (Chi, Glaser, & Farr, 1988; Ericson & Smith, 1991) see this as stable individual mastery of well-defined tasks, whose development is often portrayed as occurring in a linear stage model such as in the Dreyfus et al, (1986) five stage model of novice; advanced beginner; competent; proficient; and expert. However, this assumes that the professional knowledge base is clearly identifiable, is centred on propositional knowledge with a high theoretical content, and in some cases (Drefus et al, 1986) the examples and evidence base are of questionable validity and relevance to professionals. Instead, Schon's landmark study of the 'reflective practitioner' has been hailed as both an anti-positivist and anti-technical rationality view of professional knowledge, and a celebration of the 'artistry' of professional practitioners (Eraut, 1994). Schon drew attention to the importance of tacit knowledge and the transformation of this 'knowing in action' into knowledge that goes beyond the propositional knowledge base and concepts of the professional discipline. Schon has been criticised by Eraut (1994,) for an over-focus upon instances of professional creativity rather than everyday routine professional practice, and for lack of clarity over what is meant by 'reflection-in-action' which is presented as a series of overlapping attributes, which are contingent upon a situation, and yet is undifferentiated in terms of the speed in which it might take place. This 'rosy' view of professional learning may be wide of the mark as left to themselves, many professionals are likely to indulge in unreflective action (Starbuck, 1993) given the many demands upon their time.

Despite these shortcomings, Schon's work has drawn attention to the centrality of professional learning through everyday work. However, this then comes up against a second issue which concerns whether the concept of 'managerial learning style' might apply, *a propos* the model established by Kolb (1984) and popularised by Honey and Mumford (1992). This model remains surprisingly resilient even in the face of trenchant criticism for over-simplicity, excessive cognitive focus, preoccupation with problem *solving* rather than problem *setting*, over-focus in the individual and disregard of the socially constructed and situated nature of learning (Jarvis, 1995; Reynolds, 1997; Holman, Pavlica and Thorpe, 1997). However, it would appear that most UK business professional bodies subscribe to this concept of 'managerial learning style' as a central element in their policies of CPD.

Thirdly, there is the question of how theories of professional learning relate to wider adult learning theory. The strongly humanistic values that underpin adult learning theory (Knowles, 1989) emphasizing the centrality of human agency and personal fulfillment again marginalise the significance of situation and context on learning. This is the case no matter the importance conceded to 'critical reflection' which challenges the assumptions underpinning pre-existing frames of reference, as a key component of 'emancipatory' professional learning. Instead the attention is focussed upon processes and attendant interventions to assist critical reflection and optimise the use of informal and

incidental learning. Brookfield (1987) and Mezirow (1991) may well be able to identify a range of techniques to be used in a classroom situation to encourage critical reflection such as critical questioning, critical incident exercises, criteria analysis, role play, crisis simulation, brainstorming, scenario building), and Wood-Daudelin (1996) shows that one-to-one counseling followed by group facilitation is more effective than solitary reflection, but the conditions under which critical reflection might be encouraged or impeded in everyday professional practice have not been studied.

In as much as adult learning theory addresses the workplace, the main theme has been supporting the notion of 'informal and incidental' learning (Marsick & Watkins, 1990) which occurs naturally as managers go about their daily work, and arises out of trial and error in their tasks, and from their interactions with their own managers, peers, and customers. Both these forms of tacit learning occur in a haphazard manner, and are often triggered by disconcerting or challenging experiences. Marsick (1987) estimated that more than 80% of professional learning occurs in this way, and Marsick and Watkins (1990) provided evidence that professionals were more likely to learn from their peers (either as co-workers or mentors) a point that was reaffirmed by Eraut et al (1998). Baskett, Marsick, and Cervero (1992) have also argued that it is fallacious to assume both that professional learning occurs in isolation from others, and that learning is a purely cognitive experience. They have also shown how organisations can deliberately encourage informal learning through techniques such as action learning, peer-assisted learning, practice-based learning, individual learning contracts and mentors, 'cognitive apprenticeship' and workplace partnerships, and how important organisational context and culture is, a point that again has also been echoed by Eraut et al. (1998).

Others (Maister, 1993; Woodall & Winstanley, 1998) would argue that networking, mentoring, role-modelling, and participation in task forces and working parties create favourable conditions for such informal learning to take place. While the collection edited by Baskett and Marsick (1992) contains examples of how such techniques have furthered learning among different professional groups, to date there has not been a study examining the incidence of different types of learning among single professional groups. As Baskett, Marsick, and Cervero argue: 'One of the key implications of this work is the need for new models that take into account transformative learning, learning through relationships, intuitive knowing, the affective dimension of learning, and situational variables.' (p. 112)

The implications of the preceding discussion are that traditional theories of adult and professional learning draw attention to the importance of intuitive, tacit and social learning, but that they stop short of explaining relationships between this and specific organisational and occupational contexts. Also, because CPD schemes appear to focus upon individual effort and rely upon the individual bearing the costs of formal instruction, and loss of earnings for time off work, professional bodies are either not aware of or choose not to acknowledge the evidence of adult and professional learning, and often CPD is dominated by formal education provision that introduces a new syllabus rather than providing opportunities for reformulating existing theories of practice (Eraut, 1994)

*Proposition 3: Socio-Cultural Approaches – Have Considerable Implications for Professional Learning and CPD, but Present a Challenge in Terms of Empirical Investigation*

Reference to the social dimension of learning and 'communities of practice' has recently become fashionable. However, acknowledgment is often made in passing without full discussion of the differing perspectives and contributions. Perhaps the most oft-cited notion is that of 'community of practice' (Brown & Duguid, 1991; Lave & Wenger, 1991) to illustrate how novices move through a process of 'legitimate peripheral participation' in work settings to become experts. The main point is that the learning is interactive, informal and tacit, relying upon 'war stories' rather than instruction transmitting propositional knowledge to passive individual learners.

This approach is one of several (see Granott, 1998) that have evolved out of the activity theory developed by Vygotsky which suggests that human mental functioning evolves from the negotiation of meaning within a community of learners, and where the internal construction of reality is the result of interactions with adults, tools and more capable peers. Vygotsky's ideas were focused mainly upon childhood learning, with most research carried out in American grade twelve classrooms. However, Bonk, and Kim (1988) have shown that the six key socio-cultural concepts (zone of proximal development, internalization, scaffolding, intersubjectivity, cognitive apprenticeship, and assisted learning) can be applied to adults, and through combining the six teaching methods that are to be found in cognitive apprenticeship with seven forms of learning assistance, ten socio-culturally-based teaching techniques can be generated (modeling, coaching, scaffolding and fading, questioning, encouraging articulation, encouraging exploration, fostering reflection and self-awareness, providing cognitive task structuring, providing feedback on



performance, and direct instruction). They argue that the socio-cultural opportunities that flourish in informal adult learning settings in terms of both cultural institutions and artifacts are immense, but present a considerable challenge in working with adult learners who are accustomed to more traditional teacher-centred instruction - a point of considerable relevance to considerations of CPD.

These ideas are valuable in drawing attention to the socially situated nature of learning and in providing an intellectual challenge to the subject-object dualism inherent in cognitive approaches. However, they are not without problems, including a tendency towards reductionism (Bredo, 1994) whereby the processes of 'internalisation' of learning within the individual are ignored, and intelligence becomes an unreflective practice that just happens. In addition, the distinction between novice and expert can become problematic where individuals are moving in and out of a variety of communities of practice; and the definition of professional knowledge as something distinct from basic knowledge becomes fuzzy. Finally, the issues of professional power and status including willingness to share expertise and the role of formal teaching and instruction become unclear. To some extent this is acknowledged by some of the main proponents of situated learning theory (Greeno et al, 1999), and researchers in the field of HRD (Torraco, 1999). But while providing an interesting new insight into how professionals might learn, situated learning theory simultaneously raises problems, especially around understanding how individuals learn when they are acting across organisational contexts, and moving flexibly in and out of job roles (Triche & St. Julien, 1995).

In the same way that discussions around professionalisation require a theory of the development of expertise, so the debates around situated learning ultimately come to the same point of engaging in debate about the development of knowledge. Scribner (1986) developed the notion of 'practical thinking' based upon studies of job tasks that are routine parts of everyday activities to demonstrate how even those with little formal education such as dairy workers, become engaged in complex thought processes displaying considerable flexibility and ingenuity to both solve and set problems in their work activity. Her results provided evidence that challenged conventional cognitive assumptions about learning and in particular the movement from the abstract to the concrete. Scribner was keen to dissociate her work from those working on 'situated cognition', because she emphasised *activity* (an integrated function of thought and setting) as the defining event for practical intellectual activity, and developed a research design combining observation and in-depth interviews. Engestrom and Middleton (1998) who examined "mindful practices and communicative interaction as situated issues in the reproduction of communities of practice" (p. 1) also challenged traditional cognitive psychology to show that cognition is distributed between individuals and between human beings and their artifacts, so that "work practices are ineluctably communicative practices" (p. 4). In doing so they openly acknowledge their debt to the sociologists of the Chicago School such as Becker, Glaser and Strauss, as well as the pragmatist philosophical tradition associated with Dewey and Mead. Indeed, one of the contributors to their collection, Susan Leigh-Star (1998) also demonstrates the contribution of American Symbolic Interactionism to activity theory's understanding of the relation between work and practice. However, the main problem for socio-cultural theory is the specification of the social unit within which 'mindful practices and communicative interaction' or 'practical thinking' take place, and which can be examined in experiments without constraining and excluding the activity being studied. Granott (1998) has gone some way towards this with her notion of the 'ensemble' as a unit of analysis defined as the smallest group of people who co-construct knowledge through interaction. Nonetheless, the problems for data collection associated with this approach are enormous.

Such ideas have considerable implications for CPD. In particular, the current professional body emphasis upon individual learning, and also the preference of some for formal instruction by prescribed providers displays an ignorance of the socio-cultural dimension of learning. This would not only take account of the fact that professionals can learn collectively from their professional interactions, but that the different 'cultural milieux' including different types of workplace (for example the professional services firm versus small firm partnership or freelance consultancy) and artifacts (such as access to various forms of ICT, the jargon of professional expertise, or the location of professional offices - from big open-plan offices to 'virtual' offices for those who 'hot desk' or work remotely) might influence the learning that takes place is not considered. It also raises questions about the support provided both by professional bodies and by other trainers within organisations, and whether they have sufficient expertise in the ten 'socio-culturally-based teaching techniques' identified by Bonk and Kim (1998).

*Proposition 4: The Affective Dimension of Professional Learning is a Neglected Aspect*

Finally this paper turns briefly to the emotional dimension of learning - a subject that has been neglected relative to the attention given to socio-cultural theory. Indeed, the predominance of rational cognitive perspectives in studies of organisational behaviour and management learning has shut the affective dimension out, even from



those who provide critiques of the cognitive approach (Holman, Pavlica, & Thorpe, 1997). Of course, the work of Hochschild (1983), Fineman (1993), Vince (2001, forthcoming), and others has shown how central a consideration of emotions is to any understanding of organising. And neurological research evidence now shows that emotion is essential to cognition (Damasio, 1994). But, it is curious that the relation between emotion and learning has been neglected in relation to managers and professionals, even though it is evident that emotions can both interfere with learning and they 'shape' the learning that takes place (Fineman, 1997): "emotions should be considered not just a by-product or interference to the learning process, but also intrinsic to what is learned" (p. 13). The affective dimension also brings in the dimension of personal and private lives (Merriam & Clark, 1991). Furthermore, there is a whole area of therapeutic and humanistic psychology that recognises the link between emotional state and learning. There is certainly a need to explore this field further, but this is currently beyond the bounds of this paper.

### **Discussion and Conclusion: Towards a Research Design and the Contribution to HRD Knowledge**

There are a number of major findings from this review of literature around professional learning. Firstly, it is argued that professional learning needs to be studied in the context of specific professions, if the discussion is to progress beyond simple reporting, classification, and prescription of learning strategies. Secondly it is debatable as to whether a distinct category of professional learning exists that can be separated from managerial or adult learning. Thirdly, notwithstanding this point, the weakness of the highly individualistic approach to learning from all three perspectives demands attention to the social dimension of learning.

Fourthly, the socio-cultural approach to professional learning reinforces the importance of attention to the professional context, but is not without conceptual fuzziness over the unit of analysis to be studied, and a tendency to reduce all learning to activity and interaction, thereby excluding the personal and intra-psychoic dimension. Finally, a key element of this latter dimension, namely emotion, appears to have been excluded from most discussions of learning.

Obviously it would not be possible to address all of these points within a single research design, which must of necessity set boundaries. Thus a limited set of research questions have been identified for further study:

1) To what extent does the context of professional socialisation influence orientations towards learning and participation in CPD?

2) To what extent does the context of professional practice (location, firm structure and size, type of work, client size, source of revenue etc.) influence participation in CPD and the learning strategies adopted?

3) What balance do individuals perceive they strike between individual and social dimensions of learning, and what are the main techniques by which this is achieved?

4) How do individuals manage their learning when they are moving across organisational contexts and between different job roles in their professional practice?

These are challenging questions that present considerable problems in terms of research design and data collection in particular. At present this research project is focused upon an interpretative longitudinal research design comparing individuals who are recent graduate entrants into a profession with mid career practitioners. Following an initial collective briefing about the purpose and conduct of the fieldwork, the intention is that data collection will be principally by means of life history interviews, self-report diaries, and individual semi-structured interviews at intervals.

With respect to the contribution to HRD knowledge, this paper encourages critical reflection on established views of the distinctiveness of professional learning, and provides a case for how this might well be determined by the contingencies of professional practice. In consequence it also has implications for public policy as it challenges many of the simplistic assumptions about how professionals (should) learn, and also indicates potential courses of action for UK professional bodies in their quest to increase effective participation in CPD.

### **References**

Abbott, A. (1988). The system of professions: An essay in the division of expert labour, Chicago: University of Chicago Press.

Armstrong, P. (1993). Professional knowledge and social mobility: postwar changes in the knowledge base of management accounting. Work, Employment and Society 7(1), 1-21.

Baskett, H.K.M., Marsick, V.J., & Cervero, R. M. (1992). Putting theory to practice and practice to theory. In H. K. M. Baskett & V. J. Marsick (Eds.). Professionals' ways of knowing: New findings and how to improve professional education. San Francisco: Jossey Bass.

Bredo, E. (1994). Cognitivism, situated cognitivism and Deweyian pragmatism. Philosophy of Education Yearbook.

Bonk, C. J., & Kim, K. A. (1988). Extending socio-cultural theory to adult learning. In M. C. Smith & T. Porchot (Eds.). Adult learning and developmental perspectives from education psychology. Hillsdale, NJ: Lawrence Erlbaum Associates.

Brookfield, S. D. (1987). Developing critical thinkers: Challenging adults to explore alternative ways of thinking and acting. Milton Keynes: Open University Press.

Brown, J. S., & Duguid, P. (1991). Organizational learning and communities of practice: Towards a unified view of working, learning and innovation. Organizational Science, 2 (1), 40-57.

Chi, M. T. H., Glaser, R., & Farr, M. J. (Eds.). (1988). The nature of expertise. Hillsdale, NJ: Lawrence Erlbaum.

Dreyfus, H., Dreyfus, S., & Athanasiou, T. (1986). Mind over machine: The power of human intuition and expertise in the era of the computer. Oxford: Blackwell.

Engestrom, Y., & Middleton, D. (1998). Introduction: Studying work as mindful practice. In Y. Engestrom & D. Middleton (Eds.), Cognition and communication at work. Cambridge: Cambridge University Press.

Eraut, M. (1994). Developing professional knowledge and competence. London: Falmer Press.

Eraut, M., Alderton, J., Cole, G., & Senker, P. (1998). Learning from other people at work. In F. Coffield (Ed.). Learning at work (pp. 37-48). Bristol: Policy Press.

Ericsson, K. A., & Smith, J. (Eds.) (1991). Toward a general theory of expertise: Prospects and limits. Cambridge: Cambridge University Press.

Fineman, S. (1997). Emotion and management learning. Management Learning, 28 (1), 13-25.

Granott, N. (1998). Unit of analysis in transit: from the individual's knowledge to the ensemble process. Mind, Culture and Activity, 5 (1), 42-66.

Greeno, J.G., Eckert, P., Stucky, S.U., Sachs, P., & Wenger, E. (1999, September). Learning in and for participation in work and society. How Adults Learn.

Hanlon, G. (1997). A shifting professionalism: An examination of accountancy. In J. Broadbent, M. Dietrich, & J. Roberts (Eds.). The end of the professions? The restructuring of professional work. London: Routledge.

Hanlon, G., & Shapland, J. (1997). Professional disintegration? The case of law. In J. Broadbent, M. Dietrich, & J. Roberts (Eds.). The end of the professions? The restructuring of professional work, London: Routledge.

Holman, D., Pavlica, K., & Thorpe, R. (1997). Rethinking Kolb's theory of experiential learning in management education: The contribution of social constructionism and activity theory. Management Learning, 28 (2), 135-148.

Honey, P., & Mumford, A. (1992). Manual of learning styles (3rd ed.). Maidenhead: Honey.

Hoskin, K., & Anderson-Gough, F. (2000). From accountant to added-value business advisor: Training professionals for a changing world. Paper presented at SKOPE Symposium Continuing Professional Development: Looking ahead, Pembroke College, Oxford, May.

Jarvis, P. (1995). Adult and continuing education, London: Routledge.

Jones, N., & Fear, N. (1994). Continuing professional development: Perspectives from human resource professionals, Personnel Review, 23 (8), 49-60.

Knowles, M. (1989). The adult learner: A neglected species. Houston: Gulf Publishing Company.

Kolb, D. (1984). Experiential learning. Englewood Cliffs, NJ: Prentice Hall.

Lave, J., & Wenger, E. (1991). Situated learning. Cambridge: Cambridge University Press.

Leigh-Star, S. (1998). Working together: Symbolic interactionism, activity theory and information systems. In Y. Engestrom & D. Middleton (Eds.), Cognition and communication at work. Cambridge: Cambridge University Press.

Madden, C.A., & Mitchell, V. A. (1993). Professions, standards, and competence: A survey of continuing education for the professions. University of Bristol, UK.

Maister, D. (1997). Managing the professional services firm. New York: The Free Press.

Marsick, V. (1987). Learning in the workplace. London: Croom-Helm.

Marsick, V. J., & Watkins, K. (1990). Informal and incidental learning in the workplace. London: Routledge.

Mezirow, J. (1991). Transformational dimensions of adult learning. San Francisco: Jossey Bass.

Reynolds, M. (1997). Learning styles: A critique. Management Learning, 28 (2), 115-133.

- Sadler-Smith, E., & Badger, B. (1997). The HR practitioner's perspective on continuing professional development. Human Resource Management Journal 8 (4), 66-75.
- Sadler-Smith, E., Allinson, C.W., & Hayes, J. (2000). Learning preferences and cognitive style: Some implications for continuing professional development. Management Learning 31 (2), 239-256.
- Schon, D. (1983). The reflective practitioner: How professionals think in action. New York: Basic Books.
- Scribner, S. (1986). Thinking in action: Some characteristics of practical thought. In R. J. Sternberg & R. K. Wagner (Eds.). Practical intelligence: Nature and origins of competence in the everyday world. Cambridge: Cambridge University Press.
- Starbuck, W. H. (1993). Keeping butterfly and an elephant in a house of cards: The elements of exceptional success. Journal of Management Studies 30 (6), 885-922.
- Torraco, R. J. (1999). International learning with working: A reconception of the role of workplace learning. Human Resource Development Quarterly 10 (3), 249-271.
- Triche, S., & St. Julien, J. (1995). Reconceptualizing educational psychology: A pragmatic approach to developments in cognitive science. Philosophy of education yearbook.
- Vince, R. (2001, in press). The impact of emotion on organisational learning. Human Resource Development International.
- Wood-Daudelin, M. (1996). Learning from experience through reflection. Organizational Dynamics 24 (3), 36-49.
- Watkins, J. (1999). UK professional associations and continuing professional development: A new direction, International journal of Lifelong Education 18 (1), 61-75.
- Woodall, J., Gourlay, S., & Jarvis, P. (2000). Continuing professional development processes and the learning of business professionals, External funding proposal, Kingston Business School.
- Woodall, J. (2000). Continuing professional development and approaches to learning within the business professions, Working Paper No. 2, Kingston Business School, February.
- Woodall, J., & Winstanley, D. (1998). Management development: Strategy and practice, Oxford: Blackwell.

## A Comparative Analysis of Problem-based Approaches to Professional Development

Margaret C. Lohman  
Florida State University

*A literature review was conducted of four problem-based approaches to professional development: case study, goal-based scenario, problem-based learning, and action learning. The review found key differences in the nature of the case problems and training strategies used in the approaches. These differences result in different training outcomes, particularly with respect to single-loop versus double-loop learning and problem-solving in well-structured versus ill-structured domains.*

Keywords: Professional Development, Problem Solving, Training Strategy

Problem solving is an important aspect of professional practice (Bereiter & Scardamalia, 1993). Professionals rely on their problem-solving skills to handle the increasingly ill-structured nature of their work (Schön, 1987). Organizations sponsor a variety of formal professional development programs to develop the problem-solving skills of their professional staff. It is believed that because professional development programs generally focus on work problems as the basis for learning, the ability of professionals to solve problems improves as a result of their participation in these programs (Dixon, 1998; Lohman & Finkelstein, 2000; Schank, Berman, & Macpherson, 1999). However, previous research has found that problem-based approaches to professional development vary in their ability to foster higher-level cognitive skills. Therefore, a detailed examination of the ways that problem-based approaches to professional development are designed is warranted. Such an examination will provide useful information for designing professional development programs that promote the kinds of skills that professionals require in today's workplace.

### Problem-based Approaches to Developing Professional Expertise

Traditional studies of expertise have established that experts differ from novices in the way they solve problems (Chi & Glaser, 1985; Chi, Glaser, & Farr, 1988). Experts possess sophisticated schemata that contain information about the goals, facts, constraints, solution procedures, and possible solutions related to particular problems (Palumbo, 1990). Schemata are activated by experts during problem solving and enable quick movement from the identification of a problem to the selection and implementation of solution procedures. Activation of schemata reduces the amount of mental resources that a person requires to deal with a problem, thus increasing one's mental capacity to attend to important details of a problem—details which might prove critical to its accurate classification and resolution. Experts continually expand their expertise by reinvesting their mental resources to progressively reformulate fundamental problems at higher and higher levels of complexity (Bereiter & Scardamalia, 1993).

Professional development programs generally focus on work problems as a vehicle for learning. A decision to be made when designing these programs concerns how to structure and present problems so as to promote and reinforce expert problem-solving behaviors (Albanese & Mitchell, 1993). Four problem-based approaches are typically used in professional development programs: case study, goal-based scenario, problem-based learning, and action learning. The case study approach involves a trainer leading a group of trainees through the identification, analysis, and resolution of a problem (Fulmer, 1992; Harling & Akridge, 1998). In a goal-based scenario, trainees perform procedural tasks in a simulated work environment to accomplish a goal (Schank, 1994). Problem-based learning engages trainees in a cyclical process of problem framing, self-directed learning, and hypothesis formation and testing to solve an ill-structured problem (Hmelo & Ferrari, 1997). And, in action learning a group of individuals selects a real work problem to address, frames and analyzes the problem, generates and implements solutions, reflects on the results of the group's actions, and takes action again (Dixon, 1998).

While all four approaches involve trainees in the problem-solving process, clear differences exist with respect to the structure of the problems addressed and their representativeness of typical problems that trainees face

Copyright © 2001 Margaret C. Lohman

in practice (Gallagher, 1997; Marsick, 1990a; Norman & Schmidt, 1992; Schank, 1994). Furthermore, the four approaches differ with respect to the types of training strategies that are used to guide trainees through the problem-solving process (Barrows, 1996; Marsick, 1990a; Schank, Fano, Jona, & Bell, 1993; Watkins & Brooks, 1994). These design differences are significant, because they result in different types of learning outcomes, particularly as they relate to problem-solving skill—a skill that professionals require to handle the increasingly ill-structured nature of their work.

Therefore, the purpose of this paper is to report the results of a comparative analysis of the designs of four problem-based approaches to professional development (case study approach, goal-based scenario, problem-based learning, and action learning) and the impact of design differences on the development of problem-solving skill. Three research questions guided the analysis: (1) How does the structure of the case problems in the selected problem-based approaches differ? (2) How does the design of the training strategies in the selected problem-based approaches differ? (3) If substantive differences in case problems and training strategies are found, what impact do the differences have on the development of problem-solving skill?

### **Methodology**

A literature review of problem-based approaches to professional development was conducted. Education literature as well as business and medical literature were reviewed. The PsychInfo, Medline, Florida State University Library, and ERIC data bases were searched. Keywords used in the search included: case method, case based, case study, problem based, goal-based scenario, action learning, management training, professional development, professional continuing education, problem solving, learning skills, independent learning, and learning strategies. The resulting literature, consisting of 95 articles, was reviewed.

### **Findings**

This review of literature found that all four problem-based approaches (PBAs) focus on multidisciplinary and complex work problems as the vehicle for learning. Beyond this similarity, the literature review also found key differences in the case problems and training strategies used in the four approaches.

The nature of case problems in the four PBAs differs in two important ways. First, problems vary in their degree of structure. Described on a continuum of well-structured to ill-structured, some approaches use case problems that are more well-structured, meaning that the problems more clearly identify: (a) the type of problem, (b) procedures for specifying solutions, and (c) one or several right solutions (Frederiksen, 1984). Other PBAs use more ill-structured problems, meaning that the problems lack the three aforementioned features. Second, some approaches use prototypic problems more than others. Prototypic problems are examples of routine problems seen in practice that contain high numbers of critical features (for example, signs, symptoms, and causes) in common with other examples of that type of problem (Mandin, Jones, Woloschuk, & Harasym, 1997).

The training strategies in the four PBAs were also found to differ, with some having stronger expert-orientations and others having stronger learner-orientations. The determination of orientation was made by examining the type and sequencing of training events that are used in each approach and who is responsible for carrying out those events (Smith & Ragan, 1999). Differences in the four problem-based approaches relative to the aforementioned features of case problems and training strategies are detailed in this section.

#### *Case Study Approach (CSA)*

A case problem in the case study approach consists of a rich written account of a problem situation. This account details relevant facts, constraints, extraneous information, and conflicting viewpoints of people involved in the situation (McWilliam, 1992), and includes ancillary materials such as diagrams, charts, financial reports, memorandums, and market data (Graham, Morecroft, Senge, & Sterman, 1992). Procedures for solving a case problem are generally prescribed for trainees prior to or during the analysis of the problem. As problem analysis progresses, trainees are guided toward one or several appropriate solutions. Therefore, in the CSA the problem situation is framed for trainees, procedures for specifying solutions are provided, and trainees are led toward one or several best solutions (Gallagher, 1997). Because of these structural features, case study problems are described as fairly well-structured.



The training strategy used in the case study approach is the most expert-oriented of the four PBAs (Marsick, 1990a). The objectives for a case study are generally shared with trainees at the onset of training. Trainees engage in the: (1) discussion of the basic facts of the case, (2) determination of concepts and principles that apply to the case, (3) listing and evaluation of possible causes and solutions, (4) selection of a solution, and (5) discussion of solution implementation (Fulmer, 1992; Harling & Akridge, 1998). Trainers guide trainees through these five steps by focusing the discussion on important issues, providing trainees with factual information and theory or pointing trainees in the right direction to find answers for themselves, guiding the case analysis approaches used by trainees, using group dynamic techniques to stimulate interest, and synthesizing what has been learned in the final debriefing (Romiszowski, 1995). Because a trainer is frequently asked to supply technical information during the analysis of a case, it is helpful for that person to possess expertise in the subject matter being addressed.

The case study approach is generally conducted in a live classroom setting with a group of 20 to 30 trainees (McWilliam, 1992). However, some professional development programs have experimented with conducting case analyses via instructional and communication technology. Multimedia systems have been used to provide trainees with access to case information through links to websites and to present information in a number of formats, including text, verbal commentaries, graphics, and video clips (Birchall & Smith, 1998). Electronic communication systems, such as email and chat rooms, have been incorporated into multimedia technology to facilitate case discussions. Some common problems cited with these electronic communication systems include difficulty in maintaining an overall view of the content and structure of previous discussions as well as difficulty in keeping trainees on tasks or topics that trainers want to focus on (Romiszowski, 1995).

#### *Goal-based Scenario (GBS)*

In a goal-based scenario trainees are responsible for accomplishing a goal in a simulated work environment. The simulation begins with the presentation of the training objectives and training goal (Kolodner, 1993). Trainees receive a minimum amount of problem information at this point. They are allowed to take a variety of paths to gather information and work toward their goal, but they must work with the information and paths that are specified by the simulation. A GBS ends when a trainee produces a product that closely matches one specified by the simulation. Because a goal-based scenario requires that trainees frame the problem and because it provides a number of paths to take in deriving a solution as well as contains a limited number of model solutions, its problems are characterized as moderately structured. These moderately structured problems tend to be prototypic, representing common types of work problems found in practice (Macpherson, Berman, & Joseph, 1996; Schank, 1994).

The training strategy in a GBS is somewhat more learner-oriented than the strategy in the case study approach. Trainees typically work independently or in small groups on a goal-based scenario and are responsible for performing a number of complex procedural tasks. To accomplish these tasks, trainees gather and analyze contextual, procedural, and content information from computer-based resources, such as video clips and archived organizational records (Schank et al., 1993). Experienced consultants serve as trainers, and are responsible for coaching trainees on technical and procedural matters during the simulation.

#### *Problem-based Learning (PBL)*

Cases in PBL are more ill-structured than either those used in the CSA or GBS. In problem-based learning, trainees acquire the knowledge and skills they need to identify, understand, and solve an ill-structured problem as they encounter it (Galey, 1998). The following PBL case, dealing with the handling of hazardous materials, illustrates the three structural features of an ill-structured problem: (a) the exact nature of the problem is unclear and some information, but not enough to solve the problem, is provided; (b) more than one way to solve the problem exists; and (c) the problem does not have a single right answer:

You are the supervisor of the day shift of the local hazmat [hazardous materials] unit. It is 6:00 a.m. on a cool autumn morning. You are sleeping when the phone rings. You answer and hear, "Come to the Clear Creek bridge on Route 15. There has been a major accident and you are needed." Quickly, you dress and get on the road to hurry to the site of the emergency. As you approach the bridge, you see an overturned truck that has apparently crashed through the metal guardrail. It has lost one wheel and is perched on its front axle. You see "corrosive" written on a small sign on the rear of the truck. There is a huge gash in the side of the truck and from the gash a liquid is running down the side of the truck, onto the road, and down the hill into a creek. Steam is rising from the



creek. All traffic has been stopped, and everyone has been told to remain in their cars. Many of the motorists trapped in the traffic jam appear to be angry and frustrated. Police officers, firemen, and rescue workers are at the scene. They are all wearing coveralls and masks. The rescue squad is putting the unconscious driver of the truck onto a stretcher. Everyone seems hurried and anxious. (Gallagher, 1997, p. 15)

The ill-structured cases in problem-based learning are prototypic of problems regularly found in practice (Lohman & Finkelstein, 2000). In the medical field, for example, because pneumonia is recognized as more typical of respiratory diseases than hydrothorax, a PBL case dealing with a patient battling pneumonia would be used to develop understandings of common signs, symptoms, causes, and treatments for respiratory diseases (Albanese & Mitchell, 1993).

A learner-oriented training strategy is used in problem-based learning to help trainees learn how to solve ill-structured problems. Training objectives are specified for PBL, but are not shared with trainees at the beginning of training to avoid supplanting problem causes and solutions in the minds of trainees and thereby short-circuiting the discovery process (Dolmans, Schmidt, & Gijsselaers, 1995; Norman & Schmidt, 1992). The training strategy involves five main events: (1) a problem is presented to a group of trainees and the group attempts to identify the broad nature of the problem as well as facts, factors, and constraints associated with it; (2) trainees analyze underlying problem causes, solution procedures, and possible solutions; (3) trainees identify unknown facts and learning issues, identify learning resources, and divide up independent research tasks; (4) trainees conduct independent research; and (5) trainees reconvene, reflect on what they have learned, apply their new understandings to the problem, and refine and revise hypotheses about problem causes and solutions (Hmelo & Ferrari, 1997; Maudsley, 1999). This cyclical problem-solving process continues until one or several solutions emerge to form an appropriate conclusion to the problem (Barrows, 1996).

The conventional format of problem-based learning involves medium size groups of five to eight trainees and a trained facilitator (Lohman & Finkelstein, 2000). Trainees are responsible for determining what knowledge and skills they need to learn, gathering and analyzing information, and monitoring their progress through the problem-solving process (Galey, 1998): Trainers help trainees perform these problem-solving tasks by providing cognitive, metacognitive, and procedural support (Gallagher, 1997; Hmelo & Ferrari, 1997; Schmidt, 1994).

### *Action Learning*

The last problem-based approach, action learning, also focuses on solving ill-structured problems (Marsick, 1990a). However, the problems addressed in action learning may be the least prototypic of all four problem-based approaches. This is because participants generally choose which problems to work on and their decisions are based on the impact that problems presently have or may have on organizational performance (Raelin, 2000). Examples of ill-structured problems that have been addressed in action learning projects include the creation of financial and nonfinancial measures for assessing managerial performance and the design of organizational restructuring plans. These two problems are classified as ill-structured because they lack clear identification, procedures for specifying solutions, and one right solution. However, they are not necessarily prototypic of other problems that action learning participants regularly face in their organizations.

Similar to problem-based learning, action learning has a strong learner-orientation. Its basic premise is that adults learn best through collaboratively working with, and reflecting on, actual problems that are meaningful to them (O'Neil & Marsick, 1994; Watkins & Brooks, 1994). The process of action learning is seen as a cycle, with phases of problem identification, solution exploration, solution testing, monitoring and problem reformulation. Its focus is on problem finding and analysis. Often, problems are initially identified in technical terms, but are reformulated in people terms. This reformulation takes place as group members try out solutions and, in the process, uncover hidden misperceptions, norms, and expectations of people in the organization. These hidden perceptions, once made explicit and examined, make it possible to rethink the ways that problems are framed and solved (Marsick, 1990b).

Action learning groups range in size from 6 to 12 people (Froiland, 1994). In some situations, groups are comprised of a single stakeholder for the work problem that is being addressed with the rest of the participants coming from different businesses or functions within a company. These non-stakeholders are included to provide the group with fresh perspectives on the problem being addressed (Marsick, 1990a). In other instances, all group participants come from the same department or division of a company and have a stake in solving the problem.

Because action learning requires examination of one's private beliefs and assumptions, it can be an unexpectedly difficult and emotional process (Dixon, 1998; Watkins & Brooks, 1994). As such, it is a process that

requires facilitation. A facilitator is responsible for providing an environment where participants can make explicit their privately held beliefs, guiding participants in the examination of their beliefs, and questioning tacit assumptions shared by participants.

## **Discussion**

The review of literature found that problem-based approaches to professional development use different types of case problems. Problems tend to be ill-structured in action learning and problem-based learning, moderately structured in goal-based scenario, and fairly well-structured in the case study approach. Two of the four approaches, PBL and GBS, use problems that are prototypic of common types of problems in practice. The literature review also found that problem-based approaches differ with respect to their training strategies. The case study approach uses the most expert-oriented strategy, goal-based scenario uses a more learner-oriented approach, and problem-based learning and action learning are strongly learner-oriented.

### *Impact of Design Differences on Problem-solving Skill Development*

The identified differences in the designs of the four problem-based approaches have important implications for the types of problem-solving skill outcomes that can be expected from a training/learning experience.

In the case study approach, trainees are seldom responsible for problem framing, since rich information about a problem situation is typically provided in a case (Smith, 1987). This feature of a CSA is particularly concerning, because all too often the wrong problems get addressed in organizations, especially when problems are ill-structured, complex, and involve many stakeholders (Marsick, 1990a). Furthermore, the case study approach tends to be expert-oriented, with solution procedures, technical information, and a range of acceptable conclusions for case problems provided by trainers and/or other information sources. This directed guidance diminishes trainees' engagement in cognitive tasks related to problem analysis (Raelin, 2000). In sum, the case study approach generally limits trainees' engagement in problem framing, specifies various solution procedures for trainees to use, and limits the range of acceptable solutions. As a consequence, it is likely to promote single-loop learning (Bridges & Hallinger, 1997). Single-loop learning results in the detection and correction of a problem "without changing the underlying policies, assumptions, and goals" of the problem (Argyris, 1980, p. 291). This type of learning promotes the ability to apply newly learned knowledge and skills to work problems that are highly similar to those encountered in training. In other words, it fosters problem-solving skill in well-structured domains.

Goal-based scenario is also likely to result in single-loop learning, although for slightly different reasons. A GBS contains an indexed database of contextual, procedural, and technical information related to a work problem. Trainees receive instruction and guidance in navigating through this database as they attempt to achieve their goal. Because a goal-based scenario operates on the assumption that trainees will accept rather than question the goal, assumptions, and information provided by the simulation, it is likely to result in single-loop learning. Therefore, GBS also enables trainees to apply the knowledge and skills they acquire during training to highly similar work problems; that is, it fosters problem-solving skill in well-structured domains.

Conversely, PBL and action learning are more likely to result in double-loop learning. In PBL and action learning, participants frame problems, select and access learning resources to gather information, and generate and test hypotheses about problem causes and solutions. These activities promote double-loop learning by involving trainees in the critical examination of a problem's underlying assumptions, procedures, and goals (Argyris, 1980; Raelin, 2000). Previous research has shown that individuals apply the problem-solving and cognitive skills that they acquire in PBL and action learning when they address subsequent ill-structured or unfamiliar work problems (Chang et al., 1995; Gallagher, 1997; Marsick, 1990b).

There is a subtle trade-off between PBL and action learning in relation to developing problem-solving skill. In problem-based learning, trainees generate multiple hypotheses about problem causes and solutions, develop an inquiry strategy to gather additional information, analyze data, affirm or revise hypotheses, and select and implement solutions. This process is called hypothetico-deductive reasoning and helps people develop schemata of certain types of problems (Barrows, 1994). Schemata are activated during problem solving and enable quick movement from the identification of a problem to the selection and implementation of solution procedures. Therefore, the instructional steps of PBL mirror the hypothetico-deductive reasoning process and the result of PBL is the development of schemata. An issue that emerges from this understanding is that it is possible that the use of prototypic problems in problem-based learning leads to errors in problem solving with less experienced professionals.

Because less experienced individuals possess more superficial understandings of problem features, they have a tendency to incorrectly classify novel problems in the same category as ones they have encountered in training. Incorrect classification leads to the inappropriate activation of a schema and the incorrect selection of a solution (Barrows, 1994).

No evidence exists to suggest that this issue is a concern associated with action learning. One reason is that action learning is typically used with more experienced managers. Experienced managers generally possess fairly sophisticated schemata and are not as likely to incorrectly classify problems based on superficial features. A second reason is that action learning does not focus on prototypic problems as the basis for learning. Therefore, even if less experienced professionals did engage in action learning, they would be less likely to encounter superficially similar problems in practice and would be less likely to activate inappropriate schemata during problem solving.

### *Developing and Implementing Problem-based Approaches*

Aside from problem-solving skill development, there are advantages and disadvantages associated with the four problem-based approaches in relation to developing and implementing professional development programs.

The development of any of the four problem-based approaches is a resource intensive undertaking. Case problems take a substantial amount of time and expertise to write. Case writers must conduct background research, consult subject matter experts, and synthesize case information. The extensive amount of time required to perform these case writing activities is frequently cited as a deterrent to using a problem-based approach (Chang et al., 1995).

Beyond the time concern, problem-based approaches that utilize computer technology, such as GBS and some CSAs, incur enormous costs in the development of multimedia resources and simulations. Researchers are working on content-rich tools and scenario template tools that allow materials and scenarios in computer-based simulations to be reused (Schank et al., 1993, p. 338). Until design tools such as these are developed, the use of computer-based instructional technology will be limited to professional development programs that possess extremely generous budgets and timelines.

Development is only one hurdle in designing a successful problem-based professional development program. Another hurdle is successfully implementing the problem-based program. Successful implementation depends on three factors. To begin with, the availability of time for training must be considered. While all problem-based approaches require greater amounts of training time than directive forms of instruction, some approaches require less time than others. The case study approach requires the shortest amount of training time. Most professional development programs devote from an hour to a half day on a case analysis. The goal-based scenario requires more training time. Simulations typically last from one to three days. Problem-based learning and action learning are more time intensive than the two previous approaches. PBL programs typically last from one to four weeks and action learning projects generally last from 3 to 12 months. Some program designers have experimented with condensed forms of PBL and action learning to diminish the time problem. However, Marsick (1990a) asserts that these condensed programs do not provide sufficient time for individuals to realize many of the benefits that can only come when a team grapples with a problem over a longer time period.

A second factor related to the successful implementation of a problem-based program is the cost associated with its training format and delivery system. The case study approach is fairly inexpensive to implement because it uses large groups and requires only one trainer and one classroom facility. Goal-based scenario, problem-based learning, and action learning are more costly because the approaches use smaller training groups and these groups each require a facilitator and facility in which to meet. Goal-based scenario carries the additional cost of computer support.

A third factor related to the successful implementation of a PBA is the skill of trainers. Convention dictates that trainers be experts in the technical domain under study. However, previous studies of problem-based approaches have shown that technical experts tend to be too directive in small group discussions and short-circuit the problem-solving activities and cognitive learning processes of trainees (Albanese & Mitchell, 1993). In programs that focus on problem-solving skill development, the effectiveness of a program is dependent on the trainer assuming a facilitative role (Gallagher, 1997). This role requires expertise in methods of reflection, group communication, listening, as well as individual and group problem-solving and learning processes (Bierema, 1998). Since facilitation is a new, and often difficult, responsibility for many trainers, training should be provided to help trainers enhance their proficiency in facilitation tools and techniques (Raelin, 2000).

### *Future Research of PBAs*

Further research in four areas would deepen present understandings of problem-based approaches to professional development. First, further research of the role of independent learning activities in facilitating learning should be conducted. The case study approach is often the favorite choice of trainers because it requires the least amount of training time. In large part, this time saving is realized because trainees typically do not engage in independent learning activities in CSA. More needs to be known about the tradeoff between engagement in independent learning activities and the development of problem-solving and independent learning skills.

Second, further study of the facilitator role in PBAs is warranted. Areas for future research should include the influence of technical expertise in facilitating problem-solving groups, the role of cognitive and metacognitive guidance during group problem-solving, and the impact of facilitator training on trainers with varying levels of technical expertise.

Third, additional research on the influence of computer technology on group problem-solving activities needs to be conducted. Some professional development programs deliver PBAs through communication and multimedia technology, even though a substantial body of literature suggests that effective performance of problem-solving and decision-making tasks requires information rich media. Studies addressing the strengths and limitations of communication and multimedia technology for facilitating problem-solving activities would help clarify this disconnect between theory and practice.

Finally, most reports of problem-solving skill development in PBAs have been based on subjective self-reports of trainees and assessments of trainers. Finding objective ways to assess problem-solving skill is necessary to gain a more complete picture of the role of PBAs in promoting professional development.

### **References**

- Albanese, M. A., & Mitchell, S. (1993). Problem-based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine*, *68*(1), 52-81.
- Argyris, C. (1980). Some limitations of the case method: Experiences in a management development program. *Academy of Management Review*, *5*(2), 291-298.
- Barrows, H. S. (1994). *Practice-based learning: Problem-based learning applied to medical education*. Springfield, IL: Southern Illinois University School of Medicine.
- Barrows, H. S. (1996). Problem-based learning in medicine and beyond: A brief overview. In L. Wilkerson & W. H. Gijsselaers (Eds.), *New directions for teaching and learning* (Vol. 68(1), pp. 3-12). San Francisco: Jossey-Bass.
- Bereiter, C., & Scardamalia, M. (1993). *Surpassing ourselves: an inquiry into the nature and implications of expertise*. Chicago: Open Court.
- Bierema, L. L. (1998). Fitting action learning to corporate programs. *Performance Improvement Quarterly*, *11*(1), 86-107.
- Birchall, D., & Smith, M. (1998). Developing the skills of technologists in strategic decision making -- a multimedia case approach. *International Journal of Technology Management*, *15*(8), 854-868.
- Bridges, E., & Hallinger, P. (1997). Problem-based leadership development: Preparing educational leaders for changing times. *Journal of School Leadership*, *7*(6), 592-608.
- Chang, G., Cook, D., Maguire, T., Skakun, E., Yakimets, W., & Warnock, G. (1995). Problem-based learning: Its role in undergraduate surgical education. *Canadian Journal of Science*, *38*(1), 13-21.
- Chi, M. T. H., & Glaser, R. (1985). Problem solving ability. In R. J. Sternberg (Ed.), *Human abilities: An information processing approach*. New York: W. H. Freeman.
- Chi, M. T. H., Glaser, R., & Farr, M. J. (Eds.). (1988). *The nature of expertise*. Hillsdale, NJ: Erlbaum.
- Dixon, N. M. (1998). Action learning: More than just a task force. *Performance Improvement Quarterly*, *11*(1), 44-58.
- Dolmans, D. H., Schmidt, H. G., & Gijsselaers, W. H. (1995). The relationship between student generated learning issues and self-study in problem-based learning. *Instructional Science*, *22*(4), 251-267.
- Frederiksen, N. (1984). Implications of cognitive theory for instruction in problem solving. *Review of Educational Research*, *54*(3), 363-407.
- Froiland, P. (1994). Action learning: Taming real problems in real time. *Training*, *31*(1), 27-34.
- Fulmer, W. E. (1992). Using cases in management development programmes. *Journal of Management Development*, *11*(3), 33-37.

- Galey, W. R. (1998). What is the future of problem-based learning in medical education? Advances in Physiology Education, 20(1), 12-15.
- Gallagher, S. A. (1997). Problem-based learning: Where did it come from, what does it do, and where is it going? Journal for the Education of the Gifted, 20(4), 332-362.
- Graham, A. K., Morecroft, J. D., Senge, P. M., & Sterman, J. D. (1992). Model-supported case studies for management development. European Journal of Operational Research, 59(1), 151-166.
- Harling, K. F., & Akridge, J. (1998). Using the case method of teaching. Agribusiness, 14(1), 1-14.
- Hmelo, C. E., & Ferrari, M. (1997). The problem-based learning tutorial: Cultivating higher order thinking skills. Journal for the Education of the Gifted, 20(4), 401-422.
- Kolodner, J. L. (1993). Case-based reasoning. San Mateo, CA: Kaufmann.
- Lohman, M. C., & Finkelstein, M. (2000). Designing groups in problem-based learning to promote problem-solving skill and self-directedness. Instructional Science, 28(4), 291-307.
- Macpherson, K., Berman, T., & Joseph, D. (1996). Cases to courses: Mentored case-based training courses. Paper presented at the International Conference on the Learning Sciences, Charlottesville, VA.
- Mandin, H., Jones, A., Woloschuk, W., & Harasym, P. (1997). Helping students learn to think like experts when solving clinical problems. Academic Medicine, 72(3), 173-179.
- Marsick, V.J. (1990a). Experience-based learning: Executive learning outside the classroom. Journal of Management Development, 9(4), 50-60.
- Marsick, V. J. (1990b). How managers learn from experience: A Swedish experiment. In V. J. Marsick & K. E. Watkins (Eds.), Informal & incidental learning in the workplace (pp. 55-79). New York: Routledge.
- Maudsley, G. (1999). Do we all mean the same thing by "problem-based learning"? A review of the concepts and a formulation of the ground rules. Academic Medicine, 74(2), 178-185.
- McWilliam, P. J. (1992). The case method of instruction: Teaching application and problem-solving skills to early interventionists. Journal of Early Intervention, 16(4), 360-373.
- Norman, G. R., & Schmidt, H. G. (1992). The psychological basis of problem-based learning: A review of the evidence. Academic Medicine, 67(9), 557-565.
- O'Neil, J., & Marsick, V. J. (1994). Becoming critically reflective through action reflection learning. In A. Brooks & K. Watkins (Eds.), The emerging power of action inquiry technologies (Vol. 63, pp. 17-29). San Francisco: Jossey-Bass.
- Palumbo, D. B. (1990). Programming language/problem solving research: A review of relevant issues. Review of Educational Research, 60(1), 65-89.
- Raelin, J. A. (2000). Work-based learning: The new frontier of management development. Upper Saddle River, NJ: Prentice Hall.
- Romiszowski, A. J. (1995). Delivery systems for corporate training in the future. In M. Mulder & W. Nijhof (Eds.), Corporate training for effective performance (pp. 227-244). Boston: Kluwer Academic Publishers.
- Schank, R. C., Fano, A., Bell, B., & Jona, M. (1993). The design of goal-based scenarios. Journal of the Learning Sciences, 3(4), 305-345.
- Schank, R. C. (1994). Goal-based scenarios. In R. C. Schank & E. Langer (Eds.), Beliefs, reasoning, and decision making: Psycho-logic in honor of Bob Abelson (pp. 1-32). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Schank, R. C., Berman, T. R., & Macpherson, K. A. (1999). Learning by doing. In C. M. Reigeluth (Ed.), Instructional-design theories and models (Vol. 2, pp. 161-181). Mahwah, NJ: Lawrence Erlbaum.
- Schmidt, H. G. (1994). Problem-based learning: An introduction. Instructional Science, 22(4), 247-250.
- Schön, D. A. (1987). Educating the reflective practitioner. San Francisco: Jossey-Bass.
- Smith, G. (1987). The use and effectiveness of the case study method in management education. Management Education and Development, 18(1), 51-61.
- Smith, P. L., & Ragan, T. J. (1999). Instructional Design, (2nd ed.). Upper Saddle River, NJ: Merrill.
- Watkins, K. E., & Brooks, A. (1994). A framework for using action technologies. In A. Brooks & K. E. Watkins (Eds.), The emerging power of action inquiry technologies (Vol. 63, pp. 99-111). San Francisco: Jossey-Bass.



# ACADEMY OF HUMAN RESOURCE DEVELOPMENT 2001 CONFERENCE PROCEEDINGS

26-1

## Manuscript Release Form

**THIS FORM MUST BE COMPLETED AND RETURNED WITH EACH MANUSCRIPT.  
ONLY ONE AUTHOR IS REQUIRED TO SIGN THE FORM.**

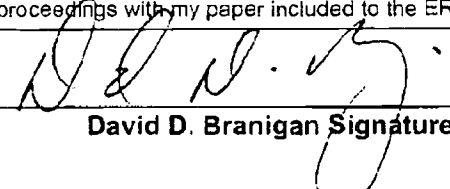
<b>Paper Title</b>	An Inquiry into the Continuing Professional Education of Information Technology Workers		
<b>Author Names</b>	David D. Branigan		
<b>AHRD Reference #</b>	022		
Please tell us where to communicate with you about this paper			
<b>Contact person</b>	David D. Branigan		
<b>Address</b>	DeVry Institute of Technology 18624 West Creek Drive Tinley Park IL 60477 USA		
<b>Office Phone</b>	(708) 342-3289	<b>Office Fax</b>	(708) 342-3315
<b>E-mail</b>	dbranigan@tp.devry.edu		

We are adding a topical index for the proceedings this year. Please list three key words that describe the primary topics of your paper. Examples might include teams, evaluation, diversity, performance measurement methods, etc. Choose words that will be of the greatest help to your colleagues when they search for research on a topic.

<b>Key word 1</b>	critical reflection
<b>Key word 2</b>	continuing professional education
<b>Key word 3</b>	information technology

The Proceedings will be submitted to ERIC after the conference. The Academy requires your signature to include your paper in the Proceedings.

I agree to allow Oscar A. Aliaga, editor of the 2001 Academy of Human Resource Development Proceedings, to submit the proceedings with my paper included to the ERIC database. By signing this I am releasing the paper for all authors of the paper.

 David D. Branigan Signature	12/14/2000 DATE
--	--------------------



## ACADEMY OF HUMAN RESOURCE DEVELOPMENT 2001 CONFERENCE PROCEEDINGS

26-2

### Manuscript Release Form

**THIS FORM MUST BE COMPLETED AND RETURNED WITH EACH MANUSCRIPT.  
ONLY ONE AUTHOR IS REQUIRED TO SIGN THE FORM.**

<b>Paper Title</b>	The Relationship Between Professional Learning and Continuing Professional Development: The Implications for a Research Design		
<b>Author Names</b>	Jean Woodall Stephen Gourlay		
<b>AHRD Reference #</b>	025		
Please tell us where to communicate with you about this paper			
<b>Contact person</b>	Jean Woodall		
<b>Address</b>	Kingston Business School Kingston Hill Centre Kingston Upon Thames Surrey KT2 7LB United Kingdom		
<b>Office Phone</b>	:	<b>Office Fax</b>	:
<b>E-mail</b>	j.woodall@kingston.ac.uk		

We are adding a topical index for the proceedings this year. Please list three key words that describe the primary topics of your paper. Examples might include teams, evaluation, diversity, performance measurement methods, etc. Choose words that will be of the greatest help to your colleagues when they search for research on a topic.

<b>Key word 1</b>	Business Professionals
<b>Key word 2</b>	HRD Theory
<b>Key word 3</b>	Situated Learning

The Proceedings will be submitted to ERIC after the conference. The Academy requires your signature to include your paper in the Proceedings.

I agree to allow Oscar A. Aliaga, editor of the 2001 Academy of Human Resource Development Proceedings, to submit the proceedings with my paper included to the ERIC database. By signing this I am releasing the paper for all authors of the paper.

*Jean Woodall*  
Jean Woodall Signature

*14<sup>th</sup> December 2000*  
DATE

# ACADEMY OF HUMAN RESOURCE DEVELOPMENT 2001 CONFERENCE PROCEEDINGS

26-3

## Manuscript Release Form

**THIS FORM MUST BE COMPLETED AND RETURNED WITH EACH MANUSCRIPT.  
ONLY ONE AUTHOR IS REQUIRED TO SIGN THE FORM.**

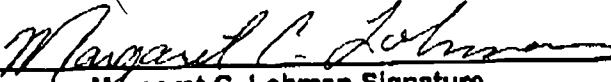
<b>Paper Title</b>	A Comparative Analysis of Problem-based Approaches to Professional Development		
<b>Author Names</b>	Margaret C. Lohman		
<b>AHRD Reference #</b>	052		
Please tell us where to communicate with you about this paper			
<b>Contact person</b>	Margaret C. Lohman, Ph.D.		
<b>Address</b>	Florida State University 306 Stone Building Tallahassee FL 32306 USA		
<b>Office Phone</b>	(850) 644-8176	<b>Office Fax</b>	(850) 644-6401
<b>E-mail</b>	lohman@coe.fsu.edu		

We are adding a topical index for the proceedings this year. Please list three key words that describe the primary topics of your paper. Examples might include teams, evaluation, diversity, performance measurement methods, etc. Choose words that will be of the greatest help to your colleagues when they search for research on a topic.

<b>Key word 1</b>	Professional Development
<b>Key word 2</b>	Problem Solving
<b>Key word 3</b>	Training Strategy

The Proceedings will be submitted to ERIC after the conference. The Academy requires your signature to include your paper in the Proceedings.

I agree to allow Oscar A. Aliaga, editor of the 2001 Academy of Human Resource Development Proceedings, to submit the proceedings with my paper included to the ERIC database. By signing this I am releasing the paper for all authors of the paper.

  
Margaret C. Lohman Signature

DATE

1/3/01