

THE EFFECT OF TEACHING METHOD ON STUDENT'S KNOWLEDGE OF
QUANTITY FOOD PRODUCTION AND SERVICE, COURSE EVALUATIONS,
AND PROPENSITY FOR PARTICIPATIVE MANAGEMENT

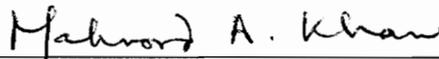
by

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(ABSTRACT)

Lecture-based (LB) and Problem-Based Learning (PBL) methods of teaching Quantity Food Production and Service were compared. After a pilot study to refine the problems and test the methods of data collection, two sections of the course were taught using the different instructional methods. The classes were compared on knowledge prior to taking either course, grade point average (GPA), attendance, final exam scores, *Instructional Development and Effectiveness Assessment* (IDEA) student evaluation instrument, and *Propensity for Participative Management* (PPM) instrument. The PPM instrument was validated with a group of management dietitians (n = 235) and restaurateurs (n = 104).

Students in LB had higher GPAs than students in the PBL section. Students in the PBL section attended more classes than did the LB section. There were no differences between the sections in their prior knowledge of nutrition and food principles (pre-test). There were no differences between the classes in the scores on the final exam. Using linear regression, the only differences which could be found among the students in either the pre-test or final exam were based on the student's grade point average (GPA), not method of teaching.

There were significant differences in the students' perceptions of the class as measured by the IDEA instrument. LB students indicated a significantly higher rating for their gain in factual knowledge, for five variables relating to the instructor's communication of content and purpose about the course, and for the instructor's ability to introduce stimulating ideas about the subject. PBL students thought the course was more difficult than did LB

students but they developed effective communication skills, were stimulated to higher intellectual effort, and thought that PBL was better for three parameters of involving students.

There were no differences between the students in terms of their propensity to practice participative management in the future either before the class began or after the learning experience. There were differences between the students' perception of participation in their organizations and the perceptions of dietitians and restaurateurs. Students were less likely to trust their subordinates/peers, were less likely to believe that participative management promoted positive relationships in the organization, and had less intention to practice participative management in the future than did the NRA/ADA professionals.

Problem-Based Learning was demonstrated to provide an equivalent mastery of subject matter as a traditional method of teaching. PBL students were more involved in their learning, were stimulated to higher intellectual achievement, and improved their communication skills to a greater extent than LB students. There appeared to be no difference in likelihood to become a participative manager as a result of either teaching method.

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CHAPTER 1

INTRODUCTION

Productivity in United States industry was viewed with alarm during the early 1980s. Output per worker-hour during the period 1973 through 1988 was one-third the rate of productivity enjoyed for two decades after World War II (Putz, 1991). Productivity in foodservice operations was one of the lowest (45%) of all industries (Boss and Schuster, 1981). Numerous studies were conducted to measure productivity and many recommendations to improve productivity were suggested.

"Whenever productivity is not at the desired level, we 'fix' something. Since to keep doing the same things but look for different results is a mild form of insanity, fixing seems logical.

We centralize and decentralize, go from management as a quantitative science to management as a people oriented art. We talk long-term strategies but reward short-term attainment. We expound over the benefits of teamwork but reward individual effort. We introduce culture changes and try matrix management. We shift from manager to leader and back, move people around the managerial grid and the situational leadership quadrants, hire more MBAs or less MBAs, and introduce 'excellence' and 'pop' psychology. We staff up, staff down, increase training, decrease training, create employee dependence, and/or empower employees. The current fix: Total Quality Management (TQM) (Payne, 1992, p.58)."

Payne opines that total quality is likely to produce better outcomes than previously attempted approaches because this method uses many effective activities and skills, not just a few.

"Total quality encompasses many elements: teamwork, participative management, ability to fail, creativity, innovation, reward structure, extensive training, high level of communications, reduction of the fear of losing security, obsession with improvement, management commitment at all levels, customer feedback, empowerment, employee involvement, problem-solving, employee/management trust, nurturing organizational climate, mutual goals, flatter organization, quantified results, real time decision making and many more (Payne, 1992, p. 58)."

Total quality management is a philosophy which is embraced with enthusiasm by a large and ever increasing number of business entities world-wide. In Japan where the impetus for quality began, Deming Application Prizes have been awarded annually since 1951 by the Union of

Japanese Scientists and Engineers (Neff 1991) to organizations which show a successful company-wide program of quality control (Kathawala *et al.*, 1991). The ultimate prize is the Japan prize which can be awarded to Deming winners after a five year wait (Neff, 1991).

The Malcolm Baldrige Award, created in 1987 with the passage of the Malcolm Baldrige National Quality Improvement Act (P.L. 100-107), has a goal to provide guidelines for quality which will improve productivity and efficiency and allow U.S. companies to compete globally (Kathawala, *et al.*, 1991, Surak, 1992). Two awards can be given annually in each of three categories; manufacturers or subsidiaries, service companies or subsidiaries, and small business. There are seven required areas which the award addresses; leadership, information and analysis, strategic quality planning, human resource utilization, quality assurance of products and services, quality results, and customer satisfaction (Garvin, 1991). Winners are not allowed to publicize their awards unless they share their quality strategies (Kathawala, *et al.*, 1991). There are detractors to the Baldrige awards (Garvin, 1991; Hill, 1993) but many think that the award is a significant factor in the increase in quality of American products (Miller, 1994). There is some thought to change the award from a competition to a qualifying award so that any firm which met the guidelines would be recognized as a winner. The limit of two awards per category would be removed (Miller, 1994).

Two of the most important components necessary in a total quality management environment are participative management and the ability to build and nurture teams of involved and empowered employees. The academic community has been criticized for not developing cooperative skills as part of the education provided. Business schools may discuss quality circles, team-building, and empowerment of employees, but they do not teach the skills necessary to implement these concepts (Kathawala *et al.*, 1991). The experience of most students in traditional universities is one in which individual performance is encouraged and rewarded. There are few opportunities to learn and work cooperatively.

Cooperative learning is not a new idea. It has roots in the Bible and Talmud (Johnson, Johnson, and Smith, 1991). Cooperative learning was incorporated by Colonel Francis Parker into the public school system in Quincy, Massachusetts in the late 19th century. John Dewey used cooperative learning groups as a successful method of instruction. Johnson *et al.* (1991) reported that the late 1930s was a period in which interpersonal competition became highly prized and cooperation moved into the background. The roots of the rebirth of cooperative learning are grounded in theories of Kurt Lewin about cooperative and competitive situations later expanded by Morton Deutsch.

Problem-Based Learning (PBL), a cooperative learning technique, was developed in medical schools during the 1970s. Medical students were found to lack the ability to integrate multiple disciplines into their learning. A solution, developed at McMaster University, was to organize groups of six to twelve students who, together with a tutor, would use problems to learn complex, theoretical information, and apply it. Success with medical students led to incorporation of PBL into many other disciplines at many levels of education. A meta-analysis of 137 college-level studies (Johnson, Johnson, and Smith, 1990) indicated: an increase in productivity of the group as the members gained expertise, committed relationships developed among the group members, an increase in social support developed, professional self-esteem was likely to be enhanced, and there were gains in thinking and problem-solving skills.

PURPOSE OF RESEARCH

Participative management is identified as a style of management which leads to higher levels of job satisfaction, reduced apathy, reduction in worker alienation, and increased productivity. The implementation of total quality management into an organization requires, among other things, a participative management style on the part of managers at all levels. College educated managers do not learn skills which would promote participative management including team building, communication, group process, or employee empowerment.

There appears to be a natural relationship between participative management and Problem-Based Learning. Both have as the underlying premise the development of heterogenous groups of individuals working together to solve problems and make decisions. It seems that using Problem-Based Learning in the undergraduate curriculum would help the student to develop skills that could be useful for managers in environments which increasingly require collaborative efforts. Both dietetics and hospitality students will be entering a workplace in which quality and productivity increases are essential to the long term viability of health care and hospitality organizations.

The purpose of this study is to determine whether the teaching method in heterogenous classes of students in dietetics and hospitality:

- affects knowledge gained,
- affects student perceptions of the quality of the course and,
- affects propensity to practice participative decision making.

CHAPTER 2

REVIEW OF LITERATURE

LEADERSHIP AND MANAGEMENT STYLE

Kotter (1990) described leadership and management as distinct and complementary requirements having separate functions and activities. Both are required in business but not necessarily in the same individual. Management deals with complexity whereas leadership is about change. Complexity is addressed through planning, budgeting, organizing, staffing, controlling, and problem-solving. Change concerns setting direction, developing a vision, aligning people, motivating, and inspiring. Kotter suggests that management is a deductive process whereas leadership is inductive in nature.

"Much of a manager's work is solving problems. These include organizing his own and his subordinates' activities, planning (for either anticipated or unanticipated circumstances), choosing his own managerial strategies, and a wide range of other decision-making activities. There are skills involved in diagnosing problems, acquiring and interpreting relevant data, assessing and testing alternative solutions, and getting feedback concerning the effectiveness of both the solution and the process used in arriving at it. These skills can be improved, and classroom education is one method utilized for this purpose." (McGregor, 1960, p. 216)

Business reorganizations have changed our perception of the roles and power of managers (Kanter, 1989). Companies now have more channels for action and influence, relationships are changing from horizontal to vertical, there are fewer distinctions between managers and non-managers, greater emphasis on external relationships, and career development is less understandable. Kanter claims that companies desire "...problem-solving, initiative-taking employees who will go the extra mile for customers (p. 91)."

Harmon (1988) reflected on the evolution of management thinking. He believed that the next phase will be the "Management of Performance Improvement" which will be "(t)he self-enhancing, participative management of continuous improvements in total business

performance (p.7).” Harmon indicated that attention is shifting from a preoccupation with mergers and acquisitions to greater concern for operations management. He identified the need for team efforts involving all employees in the implementation if not the planning of continuous improvements. He foresaw the need for two types of teams; action process teams to “launch and steer” and focused project teams for implementation. TQM is the bridge which will get American industry to the new type of management according to Harmon.

An extensive treatment of Quality in the periodical *Business Week* was prefaced by Post and Carey (1991) who asserted that management must change from its traditional style to give both power and responsibility to the employees. These authors defined quality as consistency or the absence of variation. Quality requires commitment from the highest levels of the organization. If quality improves there is a concomitant reduction in costs and increase in productivity partly because the organization no longer must invest in inspections. Post and Carey indicated that team work was not used frequently enough in America. “Most barriers to internal collaboration come from managers anxious to defend their fiefdoms (p. 16).”

McGregor (1960) indicated that managers have a variety of methods to influence and control. These include the use of authority, persuasion, professional “help” or the authority of knowledge, and interdependence. He noted that the method chosen depends on the manager’s assumptions about human nature and human behavior. McGregor articulated a bi-modal vision of managers. A Theory X manager has certain beliefs about people relating to their inherent laziness and desire to be directed. In contrast, a Theory Y manager believes people enjoy work, seek responsibility, and can be self-directed and self-controlled. McGregor espoused his overall premise that “...the theoretical assumptions management holds about controlling its human resources determine the whole character of the enterprise (p.x).”

Tannenbaum and Schmidt (1958) asserted that previous management thinking defined managers as autocratic or democratic. These authors presented a continuum of seven possible

leadership behaviors related to the amount of authority used by the manager and the amount of freedom to make decisions available to non-managers. They indicated that there are three variables which would be considered to decide how to lead; forces in the manager [value system, confidence in non-managers, leadership inclinations, and his feelings of security in various situations], forces in the subordinate [high needs for independence, readiness to assume responsibility, high tolerance for ambiguity, interest in the problem to be solved, understanding and identification with the organization's goals, necessary knowledge and experience, and their expectation about sharing in making decisions], and forces in the situation [type of organization, group effectiveness, the problem itself, and the time available to make the decision]. Tannenbaum and Schmidt suggested that the objectives of most modern managers are to:

- “ raise the level of employee motivation,
- increase the readiness of subordinates to accept change,
- improve the quality of managerial decisions,
- develop teamwork and morale,
- further the individual development of employees.”(p.179)

These authors indicated that current research suggested that more subordinate-centered behavior on the part of the manager enhanced the possibility of achieving these objectives.

Kuykendall and Unsinger (1982) used an instrument developed by Hershey and Blanchard, *Leader Effectiveness and Adaptability Description* (LEAD). This instrument measured managerial style [telling, selling, participating, delegating], style range [the number of styles used by a manager], and style adaptability [the ability to correctly fit the style to the situation]. The authors studied 155 police managers using the LEAD instrument. The results found that 51% of police managers preferred to use the selling style, 97% used two or three styles, and that 80% used somewhat to very effective styles. These results compared favorably with other studies using the LEAD instrument. Police managers had a strong aversion to using the delegating style. The authors presented several situational variables relating to

police work which would encourage this aversion.

Cooperative and competitive relationships between leaders and their subordinates were studied by Tjosvold, Andrews and Jones (1983). Medical technicians (310) completed questionnaires which measured 35 specific behaviors of their superiors relating to cooperation, competition, and individualistic behavior. These were compared with the subordinates overall job satisfaction, satisfaction with supervision, desire to perform well, and desire to stay on the job. A cooperative leader was correlated positively whereas both a competitive and individualistic leader were correlated negatively on all dimensions. It had been expected that an individualistic leader would elicit a neutral response. Men and women responded similarly to all three styles except women were more negative about an individualistic leader.

PARTICIPATIVE MANAGEMENT

Kurt Lewin was the first investigator to mention participative management. His notion integrated the industrial engineering concepts of Frederick Taylor and human relations methods. The assumption with Lewin's action research model was that everyone with a stake in a problem could help to define and solve it (Lewin, 1947). Rensis Likert (1961, 1967) integrated Lewin's ideas along with leadership and motivational studies and related these to results. He identified the superior's behavior as the key variable influencing manager's style and presented four Systems ranging from none to great participation (System 1-Exploitive authoritative, System 2-Benevolent authoritative, System 3-Consultative, System 4-Participative). Likert developed a survey instrument and analytical tools to describe organizations in terms of management style employed.

In 1986, Jane Gibson Likert and Araki extended Likert's original four Systems to include System 5. In this theoretical framework, decision making would still be widely shared and exercised by the persons or groups in the organization most competent to make them. The proposed difference would be in the leadership role. In a System 4 organization the leader

established the organizational climate which allowed for good communication and decision making, team building, development of organizational goals, and identifying and providing needed resources. In the proposed System 5 the leadership obligation would be more widely shared. New policies could be initiated by any group and would be discussed by all of the groups. Decisions would be reached by consensus and would be well understood and adhered to by all members of the organization.

An early literature review of participative decision making (Lowin, 1968) developed a theoretical model of participative decision making (PDM) emphasizing equilibrium and social change. One construct of this article proposed the dyadic relationship between superior and subordinate. If both actors supported the employment of PDM the system would continue. If, however, either became disenchanted with PDM, the system would revert to a conventional hierarchical mode of operations. Lowin presented a variety of mediating variables on PDM which he suggested needed further study.

Hrebiniak (1974) studied the relative impact of deprivation in decision making and job level on the perception of desired influence and three work related attitudes. Using 46 hospital employees he looked at job level in terms of technology, not hierarchical denotation, the difference between the current level of participation and the desired level of participation, interpersonal trust, role tension, and commitment. Job level and perceived deficiency in decision making had different effects on work related attitudes and perceptions of influence. Job level had greater impact on interpersonal trust and commitment than did perceived deficiency in decision making. People who were deprived decisionally desired more influence at the expense of the leader who was perceived as decreasing the influence of others. These subjects appeared to believe in the "fixed pie" notion of power in which superiors felt they had worked to achieve a certain level of power and were reluctant to share the power.

Anthony (1978) defined participative management as "the process of involving

subordinates in the decision-making process (p. 3).” He identified five management types based on Likert’s original four Systems from autocratic, benevolent autocratic, consultative, participative, to free rein. Anthony indicated that “the more unstable and heterogeneous the environment, the more the organization needs to decentralize its decision-making process (p. 24).”

Where as Gilberg (1988) defined participative management as “those techniques and practices which increase employee involvement in areas which can improve work practices, managerial decision-making processes, and organization performance standards (p.109).”

The benefits of participative management are increased productivity, improved morale, decreased absenteeism, and lowered waste according to a number of studies (Anthony, 1978). Anthony also identified a number of barriers to participative management including organizational, managerial, and subordinate barriers.

Halal and Brown (1981) noted that the United States has lagged behind other industrial countries in industrial democracy. They suggested that the reasons for the lack of participative management included an unrealistically positive presentation of the expected benefits along with a lack of attention to the real difficulties associated with implementation. These difficulties included the time commitment necessary for implementation, the concern that decisions will be mediocre, accountability may be confused, and the possibility that disruptive conflict can occur. Halal and Brown pointed out that personalities of managers tend to be directive and that both managers and subordinates may be unreceptive to “bottom-up” philosophies. Halal and Brown (1981) quoted Professor Mason Haire of the Massachusetts Institute of Technology who noted “Almost all managers talk in Theory Y terms [participative] but act in Theory X terms [authoritarian] (p. 20)”.

Kanter, Summers, and Stein (1986) reviewed two studies which led them to conclude

that new ways of organizing work were becoming permanent in many organizations. These changes included quality of work life initiatives, employee involvement programs, workplace democracy, and participative management. One survey of 1,618 American Management Association members found that adoption of workplace alternatives was widespread, both the public and private sector were involved, and the initiatives had moved past the experimentation phase. A second study found that Fortune 500 companies which had initiated innovative human resource practices outperformed a matched comparison of companies on five financial measures for an extended period of time, 20 years. These authors were not certain that alternative work measures were well understood or supported. They noted that those which were implemented were frequently measures which "...had the least effect on managerial and executive roles, status, power, and rewards (p. 33)." They predicted that the next decade would find more companies abandoning long vertical hierarchies because they are incompatible with newer models of organizational design.

Staff of the headquarters of a newspaper in Australia were presented with 23 specific situations and were asked to indicate whether the decision should be made solely by management, solely by employees, or by some combination (Savery and Meakes, 1994). The results of 302 surveys indicated that although a democratic leadership style was preferred generally, one in five respondents preferred an autocratic style. The situations were grouped using factor analysis into five sets. Generally the employees preferred to be involved when the decisions would affect their daily activities and their security and were less desirous of involvement in decision making for questions of less immediacy. The authors suggested that training of the staff would be necessary to allow participation in more types of decision making.

Participative management has long been used by firms in Japan. Marsh (1992) used the Aston *Centralization of Authority Scale* to study 48 Japanese manufacturing firms. He

identified the lowest level in the organization which has the authority to decide to take action on a decision without waiting for confirmation from above for 37 different decision categories. Marsh found that the most decentralized decisions were those related to identifying what outputs to inspect, what operations to study, what machinery and methods of production to use, and how to allocate the work among workers. Marsh asserted that Japanese methods were not as participatory as had been suggested elsewhere and that although Japanese workers had rights to present ideas and suggestions, the right to make and implement a decision was not extended to the worker but remained with higher level management. Some kinds of programmed decisions were delegated to lower levels but strategic, non-programmed, organization-wide decisions were made by upper level management.

Japanese management practices, however, are not exported in their entirety. Elmuti and Kathawala (1990-1991) did a survey plus open-ended interviews with executives of 24 Japanese subsidiaries operating in the Arabian Gulf Region. They used Likert's *Profile of Organizational Characteristics* and Mott's *Characteristics of Effective Organizations*. The predominate management style found in this study was System 3, consultative (14 firms), with 10 firms practicing System 4, participative. Those firms using System 4 had higher scores in management system dimensions, productivity dimensions, and satisfaction dimensions than did the firms using System 3. A modified Japanese management style was employed by the subsidiaries including group interactions such as team building, goal setting, problem solving, and quality circles. Management practices not included were lifetime employment and consensus decision making. Japanese executives indicated they were unwilling to extend trust to local managers.

Yamada (1991) pointed out some of the negative aspects of Japanese management style. He asserted that although Japanese industry was creative in developing quality control systems, as a society Japan was not creative in innovation. Yamada argued that many

institutions within Japanese society led to less innovations than those found in less cooperative societies. Education in Japan discouraged innovation. Participative management strives for cooperation not adversarial relationships. Employees with advanced degrees were not prized in research departments as bachelor-educated researchers were hired who could be trained. There was little creative tension in research laboratories. Japan awarded many fewer Ph.D.s each year and has earned many fewer Nobel prizes than had America. Yamada emphasized that when the emphasis was on harmony and conformity, committee decisions were likely to favor low-risk enterprises.

Halal and Brown (1981) reported on a survey of 363 employees with some interviews which addressed 16 forms of participation in four areas; work processes, communication, personnel actions, and compensation. The respondents were asked to indicate the actual and their ideal level of participation. Respondents also provided demographic, organizational, and satisfaction information. Only 22% of the 16 participation practices were used with self-pacing being most often identified. Work process were most often used (31%) and compensation least (9%). Ideal participation levels were 51% with a desire for communication being highest (69%). There was a significant participation gap between actual and ideal practice. The authors indicated that the vast majority of employees in the U.S. do not have participative practices in the work place but would like them. The authors profiled the employee who would like more participative practices as "...young men who expend less skill and effort in their jobs; who tend to believe that management is ineffective; and who tend not to be loyal to their organizations (p.26)." These employees were not unhappy with pay or relations with co-workers but with working conditions, supervision policies, opportunities for advancement, their own level of responsibility, and the work itself.

Goll (1990) conducted a survey of Vice Presidents for Human Resources for 155 manufacturing firms in the United States. She was interested in testing two conflicting models

of industrial human relations; 1) environmental pressures shape corporate ideology which then influences the company's participative practices or 2) industrial relations outcomes are shaped only in part by environmental pressures. Value systems within the organization shape the choices made. Goll defined ideology as an array of beliefs and values about the world that structure a reference framework and become the view expressed by the important decision makers in external communications. Variables investigated included environmental pressures (domestic and/or foreign competition, government regulation, industry or market deregulation, union pressure, changing industry structure, and demographic changes in the workforce) and corporate ideology (individualism, corporate social responsibility, government involvement, risk taking, organicity, technocracy, participation, and coercion). Formal participation included problem-solving groups, autonomous work groups, business teams, productivity-sharing plans, employee-management joint programs, quality circles, and quality-of-work life programs. Goll found that ideology is not much influenced by environmental pressures. But ideology influenced participative practices. She found support for the second model that activities at the highest level of management strongly influence participative practices at the third level.

Connor (1992) studied the role of organizational context on patterns of employee participation in 101 nursing homes in Oregon. He assessed the role of organization size, overall technical complexity, and profit-making orientation. He concluded that larger nursing homes and those with greater technical complexity had higher degrees of participation in decision making. Whether or not the facility was operated for profit did not seem to affect the amount of participative decision making.

Collins, Ross and Ross (1989) surveyed 485 upper-level managers from 59 companies using gainsharing as a surrogate for participative management. They developed 15 hypotheses which addressed the managers' perceptions about the current and ideal management style, the need and support for change within the organization, and the expected outcomes of

participatory management. The survey contained 70 questions, many adapted from the Likert model of ideal and actual management styles. The authors found that the current management style was System 2 (benevolent authoritarian) for five of six questions but the ideal management style was System 4 (participative). There was strong agreement for the need for change but less enthusiasm when the vehicle for change was an employee involvement program. Although the managers personally supported participative management, they doubted support by other management personnel, especially supervisors. Employees were expected to support gainsharing programs by the survey respondents. The authors concluded that support for participative management is strong but there is a lack of leadership to bring about the required changes. They concluded that some of the fault can be attributed to academic institutions which needed to train managers to be agents of change. More importantly though was the indication that managers should openly discuss with each other their desires for greater employee involvement.

Yucelt (1984) conducted a survey of 59 Turkish executives of both private companies (four firms) and state owned enterprises (one) using a Likert-style questionnaire. He found the managerial style in private companies in Turkey was closest to Likert's System 3 (consultative) and in the state-owned organization the style was closest to System 2 (benevolent authoritarian). This author indicated that the Turkish State Planning Organization had recommended a change in the educational system both in the classroom and for on-the-job-training to incorporate methods which would allow Turkish managers to learn a more participative style to improve productivity, efficiency, morale, and to reduce absenteeism.

Bruns and Shuman (1988) studied police supervisory personnel in Arizona using the *Likert Management Systems Scale*. The Likert System is scaled from 1-20. These authors found a mean score of 9.3 indicating that the existing organizational pattern was System 2 (benevolent-authoritative). The preferred pattern for police officers was a mean score of 16.6,

System 4 (participative-group). They found that officers in medium and large size departments had a score which indicated management style was less participative (System 2) but officers in small departments had a mean score which placed them in System 3 (Consultative). Bruns and Shuman found law enforcement supervisory and middle managers would prefer a more participative management style.

POSITIVE OUTCOMES OBTAINED WITH PARTICIPATIVE MANAGEMENT

An article by Margulies and Black (1987) provided a structure for using participative techniques. They summarized the literature highlighting the advantages of participation.

- Understanding and acceptance of decisions
- Commitment to implement decisions
- Understanding of objectives
- Fulfillment of psychological needs leading to greater satisfaction
- Social pressure on rest of group to comply
- Team identity, cooperation and coordination
- Improved ways to resolve conflicts
- Improved decisions

These authors also identify the conditions which are required to promote effective participation:

- Knowledge and skills
- Leader confidence in subordinates and in participation
- Needs of the individual for participation
- Desire to participate
- Beliefs about how instrumental participation will be in bringing about change
- The value of the expected outcome
- Whether participation is congruent with the leadership style of the organization
- The differences in status level of the participants
- Time available

The parameters of participation programs included the issues to be considered, the processes to be used, and the degree of participation in any one or more of the processes. Margulies and Black asserted that participative programs may be good ways to change the culture of organizations but many variables needed to be considered to ensure effective implementation of these programs.

Nightingale (1981) investigated the effect of both supervisory style and organizational structure on organization member outcomes including alienation, attitude toward change, commitment to the organization, and attitudes toward management. Using 20 companies in Canada which were paired based on whether they were formally participative or hierarchically structured, Nightingale studied 50 people in each firm. He found that member outcomes were most positive in firms which had a formal participative structure and a participative supervisory style. The author indicated that there tended to be a congruence between structure and style and that the effect of style was more powerful on member outcomes. He noted that organizations which changed structure to one that was more formally participative would find a lag during which supervisory style was not modified. He recommended that organizational change should focus both on structure and supervisory style to be most effective.

Sashkin (1984) argued that participative management was an ethical imperative. He defined participative management as participation in goal setting, making decisions and choosing an alternative, problem-solving, or making changes in the organization. Sashkin's premise was "(p)articipative management, properly implemented, is clearly effective in improving performance, productivity, and employee satisfaction (p. 6)." He provided a model of how participative management worked to produce increased productivity and performance. He further asserted that the basic human work needs are autonomy, completion of a whole, and interpersonal contact. Participative management provided for all three of the basic human needs. Sashkin developed a chain of evidence to show when basic human work needs are frustrated the employee is harmed both psychologically and physically. Using a minimalist ethical position Sashkin concluded that since harm is inflicted both physically and psychologically by not providing the basic human work needs, and participative management provides for all three needs, an ethical manager can not fail to use participative management.

Locke, Schweiger and Latham (1986) strongly opposed Sashkin's assertion that ethical

managers should use participative management. Their review of the literature did not support participative decision making as providing higher productivity than authoritative decision making. They indicated that while participation may improve results, it does not do so consistently although there are some situations in which participation works well. They also argued that employee satisfaction is more complex than Sashkin suggested and is a result of achieving one's job values. Satisfaction is related to multiple factors including the work itself, pay, promotion, working conditions, co-workers, supervision, and the organization. Locke *et al.* (1986) argued against participation as an ethical imperative. They did not view job satisfaction as an ethical right but the joint responsibility of both the employee and employer. This response by Locke *et al.* (1986) followed considerable research which failed to find a link between participative decision making and productivity.

White and Locke (1979) used the critical incident method to look at productivity of 152 employees in three occupational groups. They identified external events, agents, and personal traits which could influence productivity. They concluded that their results supported scientific management which included goals, deadlines, amount of work, work routine, and pay as the most potent influence on productivity followed by management by objectives and job enrichment.

Locke and Schweiger (1979) completed an extensive literature review on participative decision making (PDM), excluding job enrichment. They concluded that PDM may lead to higher levels of satisfaction but not higher productivity than do more authoritarian methods. Locke and Schweiger indicated that subordinate knowledge is the single most important contextual variable in determining the usefulness of PDM. They suggested further that productivity, not satisfaction, is the proper goal of a profit-making organization.

Steel and Mento (1987) reviewed the literature and concluded that although many authors identified strong support for a positive relationship between a participative

management style and employee morale, there was a lack of support for the premise that a more participative style improved productivity supporting the viewpoint of Locke and Schweiger, (1979). They suggested that the effect of participation was situational and that there may be confounding variables which should be considered. Steel and Mento conducted a study of six military organizations correlating employees perception of participation in decision making with job satisfaction, self-reported competence rating, and supervisory performance appraisal. These authors found that participation in decision making correlated positively with job satisfaction, job performance, and overall job effectiveness. They found that competence level did not moderate the participation-performance relationship. They suggested that the results showing a positive relationship between participation and performance related to the sample being drawn from military organizations which had a traditionally hierarchical structure and that when participation was unexpectedly encountered, performance was improved. Steel and Mento concluded that there is no universal effect on productivity by participative management.

Sashkin (1986) responded to Locke *et al.* (1986) with a renewed emphasis on the ethical responsibility of managers to use participative methods in the right circumstances. He first provided a clarification of definitions of participative management indicating that his is broader than the limited participation in decision making of Locke *et al.*. Then he demonstrated how there were differing interpretations of the research results, and that Locke *et al.* misunderstood Sashkin's views. He asserted, as well, that they held differing views about organizations. There are clearly differing viewpoints of social scientists about the usefulness of participative management in the workplace.

A recent book, *The Age of Participation* by Patricia McLagan and Christo Nel (1995), strongly supported the idea of introducing and accepting participation as the preferred method of organizing workplaces. The authors argued that civilization has moved further away from an

authoritarian model and that the workplace should reflect participation as the preferred way to manage. They cited studies which demonstrated that participation provides for greater profits to the organization. Suggested are nine “levers”, all of which should be addressed to assure that participation is fully accomplished: values, structures, leadership, management processes, information, relationships, competencies, controls, and pay.

Tjosvold (1985) conducted a study with 64 undergraduate students to consider the notion that participation is not a unitary concept. He hypothesized that the dynamics between employee and superior will affect the quality of the decision among other outcomes. He utilized Deutsch’s theory of cooperation and competition to see how these contexts affected the decision-making process. Cooperation, the belief that one person’s movement towards goal attainment, facilitated the goal attainment of another, facilitated the decision process and resulted in higher quality solutions.

In order to interpret these conflicts Cotton, Vollrath *et al.* (1988) identified 400 articles about participative management, reduced the total number to 91, and clustered the articles in terms of six properties (participation in work decisions, consultative participation, short-term participation, informal participation, employee ownership, representative participation). These authors did not view participation as a unitary construct. When the clustered articles were reviewed the outcomes were different for the various categories.

- Participation in work decisions was formal, direct, and had long-term results. It had positive effects on productivity and mixed results on satisfaction.
- Consultative participation was also long-term, direct and formal and included Scanlon plans and quality circles. The outcomes in performance and satisfaction were inconclusive.
- Short-term participation was formal, direct, of limited duration, and concerned with the work itself. There was no effect either on performance and satisfaction.

- Informal participation of which five studies were reviewed looked at existing superior-subordinate relations. These studies uniformly found positive results in both performance and satisfaction.
- Employee ownership was classified as formal and indirect participative decision making and had positive outcomes in both performance and satisfaction.
- Representative participation was classified as formal, indirect, and of medium to low influence. There appeared to be no effect either on performance or satisfaction for most workers.

These authors concluded that “participation is a multidimensional or multiform concept (p. 16).”

They suggested that future studies should:

- examine contextual or contingency variables,
- explore novel forms of participation,
- consider interactions among various forms of participation,
- and investigate the effects of various forms of participative decision making on other outcomes.

Denison (1984) demonstrated that the culture established within a firm has an effect on financial performance. He studied American firms using data which had been collected from 1966 through 1981 in a 125 item “*Survey of Organizations*”. This instrument incorporated scales which measured organizational climate, work design, leadership, group functioning, and satisfaction based on individual perceptions about how the organization is managed. There were 43,747 respondents in 6,671 work groups in 34 firms. The 34 firms were divided in half based on the survey results into scores above or below the average. These firms were then compared for five years after the surveys were completed using two financial ratios (return on investment [ROI] and return on sales [ROS]) which were standardized with similar industries. Denison found that firms which created adaptable work methods which linked individuals to

the goals of the organization had higher ROI and ROS over the five years studied. Firms with high survey results were significantly better than those with low survey results from year 0 through year 5. Firms which relied on participative decision making did not show improved results from year 0 through year 2. But from year 3 through year 5 the results were reversed and firms practicing participative management had significantly better financial results.

Denison concluded that participative management seemed to take time to improve results because everyone needed to be involved. Denison included four reasons why participative management works: individuals get a sense of ownership; coordination becomes part of planning, problem-solving, and decision making; responsible work habits are developed; and groups can solve complex problems better than individuals can.

Kravetz (1991) reported a survey of 150 medium to large Fortune 500 firms studying 50 employee management practices. A composite score (Human Resources Progressiveness [HRP]) was compared with seven financial parameters mostly related to five year growth patterns. Those companies with high HRP had significantly better financial results with the exception of Price to Earnings Ratio which was not different between firms having high or low HRP. Kravetz found that a participative management style had the strongest relationship to good financial results with other independent variables including a strong company culture and flat, decentralized structure also important. A follow-up study of 30 firms at two points in time was conducted to determine if good financial results were the cause or result of progressiveness. Twenty one of the companies improved progressiveness, five remained the same, and four declined in progressiveness. The companies which improved progressiveness improved financial performance (+ 78%), those with no change in progressiveness improved financial performance as well (+ 10%), but companies in which progressiveness decreased also had poorer financial performance (-22%). These results among others demonstrated to Kravetz that increasing human resource progressiveness had a powerful effect on financial

performance.

DIFFICULTIES IMPLEMENTING PARTICIPATIVE MANAGEMENT

The barriers to using participative management identified by Anthony (1978) were organizational, situational, subordinate, and managerial. Gilberg (1988) looked at only managerial barriers which could include loss of managerial maneuverability, perceived loss of control, possibility of poor quality decisions, increase in conflicts, additional requirement of managerial time, fear of loss of power, lack of discipline, and loss of personal visibility. Gilberg modified the survey of Halal and Brown (1981) and studied 204 managers from four types of organizations to determine the current use of and desired use of 15 techniques in three functional areas; improving work process, improving decision making, and organization performance standards. The results indicated that most managers would prefer more participation and that for 12 of 15 practices, 70% of managers surveyed felt the practices had a positive effect on employees' attitude at work. He found that managers with lower incomes and fewer than five years in the organization were most likely to practice participative techniques.

Eaton (1994) studied the survival of employee participation programs in a unionized setting. She surveyed at a three year interval units from both the union and management perspectives. Independent variables which were important to predict survival of employee participation programs were labor relations, union concessions, fragmentation of representation, and the degree of integration of collective bargaining and participation. She found a surprisingly high survival rate of employee participation programs (70 to 80%) over three or more years in spite of the fact that "...in most cases union management relations remained adversarial and tense, even as the parties jointly, or management more or less unilaterally, experimented with new participative forms for workers (p.387)."

Generally changes resulting from the participative programs favored management goals of

increased productivity and quality, and reduced production costs.

Gowdy (1987) identified reasons to implement quality of work life (QWL) programs for social workers. She proposed methods to incorporate QWL including the development of sociotechnical/autonomous work groups, job restructuring, participative management, and structural changes within the organization. Gowdy recommended participative management when the workers have advanced levels of knowledge and skills and when direct supervision is either difficult or inappropriate.

Lovrich (1985) wrote that although many authors touted the value of participative management and most managers agreed that it should be the predominant management style, non-participatory practices were used by many administrators. Lovrich cited reasons offered as to why managers did not practice participation. The author used a requirement in Washington State that public employees have performance evaluations performed in a participatory manner to test several frequently encountered arguments against participation. He found little support for the most often used justifications including "...poor assessment of supervisors, a weak commitment to the work ethic, a non-enriched job, or a low regard for organization-wide openness to employee involvement (p. 22.)".

Lovrich believed that the justifications reflected a fear of change on the part of supervisors. He recommended skepticism when arguments against participative management are made.

According to Vogt and Hunt (1988) over 50% of participative work groups would fail due to macro and micro organizational issues. They found that there was a lack of strategic planning for organizational change. There was little appreciation of the effect that participative work groups have on the structure of the organization. In addition, groups were not well integrated into the organization's hierarchy so permanent support was not provided. Participative work groups did not work well in organizations with much uncertainty including

fear of layoffs and changes in management. Traditional leadership styles did not encourage participative work groups and work group members were unaccustomed to consensus decision making. "Americans aren't accustomed to having significant input in decision making, although their political philosophy would indicate the opposite (p. 98)."

A comparison of managerial attitudes about participative management between American and European subsidiaries of the same firm found resistance in Europe to importing the American vision of participation to factories in Britain, Holland and Spain (McFarlin, Sweeney, and Cotton, 1993). The study included semi-structured interviews with managers in each production facility and surveys of 91 managers in each plant. There were attitudinal differences expressed by European managers from the expressed view of the American multinational firm which promoted the "creative and entrepreneurial" abilities of the employees. The Dutch managers perceived that they already had a good informal working culture in Dutch plants through their Works Council. The British managers seemed to be threatened by the decision-making authority of American-style teams. Spanish managers reported a lower level of participation than did Dutch and American counterparts. The authors opined that American managers possessed different values about employee participation and that efforts on the part of the multinational corporation were thought to be "heavy-handed and out-of-touch with local values by European managers (p. 378)." The authors found that practices in the European subsidiaries were focused on eliminating or overriding local cultural values which were not in agreement with the prevailing corporate culture.

Brown (1992) wrote that many management experts were questioning whether participatory management could ever work in a large number of organizations in the U.S. Although there were some well documented positive results, participatory management was viewed as the most difficult management style. Many conditions predisposed failure of participatory efforts including corporate bureaucracy, the recession, and office politics.

American culture with its tradition of "rugged individualism" did not support the communal decision making and power shifts that participation required. Schools taught competition not collaborative learning. The recession with layoffs and salary freezes served to reduce trust which was crucial to participative management. Participative management was unlikely to be successful if implemented in an unstable environment. Most managers would resort to a more authoritarian style in a turbulent situation. First line managers viewed participative management as a loss of power for themselves. Brown reported that hundreds of U.S. companies have managed to be successful while moving from autocratic to participative organizations but there were suggestions that they were in the minority.

Gleeson, McPhee, and Spatz (1988) conducted a survey of upper and middle management plus supervisors in 47 firms in the Metal Trades Industry Association in Australia. They determined that as many as 85% of the firms participated in Health and Safety Committees with lesser involvement in other employee involvement groups. Managers believed that the most successful employee involvement activities were regular meetings between management and employees and the health and safety committees. The least successful groups were those involved in either quality control or productivity improvement. In this study upper management perceived there was more employee participation than did middle management or supervisors. The authors were surprised that no level of manager thought that training was needed to improve skills in participative management. Gleeson *et al.* theorized that participative management is unlikely to be introduced if middle managers and supervisors lack "...the ability, confidence, and skills to handle the required attitudinal changes in dealing with superiors and subordinates (p. 36)."

Cabot (1989) developed a matrix to help an organization determine its readiness to implement employee participative management. One continuum of the matrix was an assessment of the various types of employee involvement programs: from employee idea

systems, focused task forces, problem-solving teams, cross-functional groups, union-management committees, process improvement groups, self-managed work teams, intrapreneuring, employee ownership, and control. The second continuum was the learning continuum which assessed the types of knowledge and skills needed. At the lowest level were interpersonal relations. Knowledge and skills needed move to higher levels included group process/problem solving, employee relations, organizational analysis, and business process. Cabot indicated that using the matrix would help to identify where the organization currently was in its efforts to increase employee participation and what training would be required to move to a different level of employee involvement.

MEASURING PARTICIPATIVE MANAGEMENT

Parnell, Bell, and Taylor (1992) developed a 13 item instrument which identified participative tendencies for managers. "Propensity for participative management (PPM) refers to a manager's tendency to employ direct participative techniques and in doing so, shift some of the responsibility and authority for decision making to the subordinates (p. 32)."

The evolution of this instrument was through a literature review from which 119 items were written. These were reduced to 33 items which were tested on 128 employed undergraduate students. Using factor analysis the authors were able to produce a 12 item instrument which was then tested on 220 people for reliability and validity. They included a 13th question which looked at the intention to use participative management and became the dependent variable in a regression analysis. There were three constructs in this instrument which were used to predict the probability of employing participative measures: an assessment of the prevailing culture, stability of managerial power, and relationship between participation and performance.

In a survey of 209 students enrolled in Business Administration program, Crandall and Parnell (1994) found that a propensity for participative management correlated negatively and was the best indicator of intention to leave a position. These authors measured job

satisfaction, organizational commitment, level of management, years of management experience, and years of total work experience. Other findings included a positive correlation between years of management experience and PPM, and a positive relationship between PPM, job satisfaction, and organizational commitment.

TOTAL QUALITY MANAGEMENT (TQM) AND PARTICIPATIVE MANAGEMENT

W. Edwards Deming is generally acknowledged to be one of the founders of the TQM movement both in Japan and in the United States. Deming (1985) argued that Western-style management had multiple flaws which contributed to a declining market for American made products. He exhorted American firms to develop plans and methods which would improve products and services leading to a concomitant decrease in costs and therefore price to the customer. He identified 19 practices which contributed to the decline in market share. One of these is a reliance by managers on quality control circles or other methods of employee involvement without management participation. Deming provided what he referred to as the "14 points" which were the basis for his management approach. In his view management must recognize the need to change and communicate the 14 points so that all will have the courage to change.

According to Vincoli (1991), "Total quality management is a customer-focused, strategic and systematic approach to continuous performance improvement (p. 28)."

This definition from the Quality and Productivity Management Association is expanded by Vincoli. He described four principal elements of TQM:

- Ensure customer satisfaction through identifying all customers both external and internal, clarifying customer needs, providing for customer delight, and obtaining customer feedback.
- Ensure a supportive cultural environment through a code of ethics, the development of people, communication, participative management at all levels, and empowerment of subordinate employees.
- Develop teams and partnerships including process-oriented teams and true partnerships with suppliers, labor unions, other departments, other corporate components, and customers.

- Ensure disciplined systems and processes through managing the necessary changes in a disciplined manner, continuously improving everything, and strategic planning.

Glenn (1991) reported on the components needed to have a successful TQM program. These included customer focus, leadership, teams, and tools. The teams are created to both recommend and implement change. The advantage of teams is that, if created properly, they solve problems or improve work processes, and cause people to take ownership for their work.

Braunstein (1989) reported a case study showing how Douglas Aircraft moved from an hierarchical company to a customer-focused TQM firm. The pressure to change was identified in the early 1980s after the firm lost money for eight consecutive years. The need to return to the founder's values was identified. In the period of 1983-85 twenty separate well-thought out programs were tried and abandoned because there was no change in management. In 1986 a new initiative modeled on the Nummi plan used in a California Toyota plant gained support from the union. Teams of workers were organized and trained. Much was achieved but the firm was still troubled by inconsistent support from management. In 1989 the management system was changed. Top management was replaced. Management layers were reduced, in some cases from two to five levels were eliminated. All managers were fired and then were re-hired as appropriate, but ultimately 40% of the previous managers did not return. Manager's jobs were redefined and the firm was reorganized on product lines. A culture change was implemented which encouraged teamwork and consensus decision making. The view of leadership was changed entirely.

Mead, Rasmussen and Seal (1986) reported on changes in a government bureaucracy with the initiation of quality assurance (QA). The Equal Employment Opportunity Commission developed a QA program with three major components: statistical measurements of the work, the development of participative management including a culture change from an autocratic style to one involving employees at all levels, and the assessment of client perceptions of service quality. These authors discussed participative management based on the assumptions

about a Theory Y manager articulated by McGregor. The adoption of a phased-in QA program provided examples of excellent reductions in defective products associated with processing complaints by citizens.

Caudron (1991) wrote about the Martin Marietta Astronautics Group which implemented TQM in 1989. They changed the organization to a flatter structure with fewer hierarchical levels and included more participative management. High performance multi disciplinary work teams of 15 to 20 employees were developed. These teams selected projects for study. The results were impressive. The group experienced large savings in production costs and significant savings in reduction of overtime. They also identified intangible benefits including improved morale, enhanced communications, and a perception by employees of greater control over their jobs.

One requirement for success of TQM programs is for training. Luzon (1993) noted that in Europe, TQM is more advanced in industry than in academic areas. Therefore industry has done most of the training. Luzon studied 44 small to medium sized firms in Spain and found that for 77% of the firms TQM programs were less than four years old. Training was widespread in all 44 firms but 18% of the companies only trained employees, not managers. Training was the only method used to provide the motivation for change for the employees. There was little consideration in the firms for a participative management style, modifications in pay/promotion structure, or involvement by managers in training for quality improvements. The author suggested this lack may make it harder for employees to become committed to the new methods.

TQM like other employee involvement programs which promised changes in the workplace along with improved quality and productivity has been reported to fail or to be abandoned. Danjin and Cutcher-Gershenfeld (1992) indicated that problems with maintaining these programs related to what Deming referred to as root causes of variance in quality; special

causes or common causes differ in whether the changes to eliminate problems require systematic and/or organizational changes. During the beginning stages of employee involvement programs special causes were encountered which required no systematic changes and were relatively easy to fix. When common cause problems were encountered systematic changes were needed which led to turf battles, invocation of "past practices", rules and procedures, and potential for power shifts. The authors indicated that when common causes were encountered it became possible to identify the level of management commitment. There could be a pull back or discontinuation of the program without management commitment, or efforts may be made to revise the system to eliminate the common cause. TQM was as vulnerable to failure as other employee involvement programs if attempts were made to integrate it into the existing organization.

Daniels (1992) wrote that progress in the United Kingdom towards BS 5750 (accreditation of the quality system process) had been relatively rapid but progress towards TQM had not. BS 5750 was procedural and had short-term effects while TQM was a culturally-based method with long-term effects. TQM required an open and participative management style but progress in using participative methods was slow. Daniels suggested that one reason is the focus on short-term financial results. Further, when TQM was tried and failed, TQM was discredited not the managers who did not think out or implement it properly. Changing from an hierarchical, control-based to an open style of management required many changes, not only for management but also for employees. Daniels identified many requirements for successful TQM programs; vision, structure, philosophy, core values, management style, job design including the development of teams, problem-solving, information, and changes in the payment and reward systems.

Kathawala *et al.* (1991) indicated that significant changes in the culture of the organization needed to occur before active involvement by employees could be expected.

These authors suggested that such dramatic changes are frequently resisted by managers because of ignorance or fears about the loss of power.

Lynch (1991) opined that difficulties associated with being competitive in international trade are outmoded methods of managing people and organizing work. Leaders must change their core principles including their preference for command, control, and compliance. Lynch discussed the historical roots for these three principles and indicated that managers needed to create environments that would energize employees toward a common goal. New principles to be used included commitment, consensus, and creativity. He identified a number of ways to elaborate these principles. Each employee should become aware of the customer. Efforts should be made to combine tasks, not divide them. Power should be transferred to employees who work with either the product, the process, or the customer. Innovation which Lynch defined as the continuous improvement of a product, process, or service should be encouraged. Natural work teams which meet frequently on an ongoing basis should be developed and supported.

Price (1989) recommended changing from management by control to management by quality leadership. Carder (1991) used the analogy of breaking bad habits such as alcoholism and drug dependency for breaking bad management habits. He indicated that management habits are based on education and training and are embedded into the culture. Poor management practices worked often enough to provide some short-term success even though over the long-run the poor management habits were destructive. Carder provided five steps which he calls the Psychology of Change. First, the individual must identify a need to change. He noted that Deming thought this would happen with companies enjoying a monopoly when actually it was more likely to occur when companies were in difficulty. There would be real discomfort associated with the change. Next, the change must be voluntary and the change process needed a philosophical foundation. Other steps in the model included the necessity for

others to be involved in the change process and that the process should occur in small increments beginning with education and communication.

Martin (1994) predicted that TQM in its present form was likely to disappear much like other popular management fads. Remnants of TQM would survive including the major shift in thinking from a product-oriented focus to a customer-oriented focus; a commitment to quality on the part of the entire organization; the development of standards of quality; integration of the standards into day-to-day operations; and a continued emphasis of on feedback including measuring, monitoring, and rewarding.

McConnell (1995) indicated that less than 50% of TQM programs are viewed as successful. Reasons for lack of success included: the lack of commitment by top management, resistance by line managers, unrealistic expectations of TQM, greater interest in the process of TQM than in the results, and lack of understanding of empowerment. The most important causes of failure were resistance to change and the traditional management paradigm. McConnell indicated that the historical management paradigm was authoritarianism which was supported by Taylor's Scientific Management. The difference likely to be experienced by the employee was a benevolent autocrat in contrast to an exploitative autocrat. Most management theorists who recommended modifying management style to a more participative model were highly regarded in the academic world and rarely applied in the "real world of work (p. 76)." McConnell suggested that attempts to bring more participation to the work place have been tried many times in the past and all have failed. The concepts continue to reappear and meet with incrementally greater success than the previous time. This he attributed to the changing management paradigm which is slowly shifting to more open participation.

MANAGEMENT NEEDS IN THE FOODSERVICE INDUSTRY

Cichy, Sciarini, and Patton (1992) surveyed 51 leaders in the hospitality industry to

identify the most important attributes of leadership. For this study they used attributes identified by Bennis and Nanus (1985) in their book "Leaders" and Labich (1988) who wrote "Seven Keys to Business Leadership." The most important attributes of the surveyed hospitality leaders were vision, communication, trust, and perseverance. The authors recommended development of these leadership skills in college through their emphasis in the classroom and encouragement for students to participate in activities which involve some level of responsibility and teamwork.

Dailey, Young, and Burr (1991) reported the results of an effort to involve middle managers in hospitals in making decisions which previously had been the purview of top management. A focus group was created of 10 middle-level managers from a variety of disciplines. All were trained in business problem-solving, quality circles, employee participation in decision making, and providing formal feedback to top management. Then the group identified 12 problems which could be addressed in a multi disciplinary approach. Top management then selected four of the problems and developed problem-solving teams for a pilot study. All of the teams successfully developed solutions which improved both quality and productivity. The managers gained the ability to solve previously ignored problems and learned to function effectively in teams.

In contrast to the emerging view that participative management is useful, Nebel and Stearns (1979) concluded that participative management is not appropriate in most hospitality environments. They based their research on McGregor's *Theory of manager's assumptions* and Fiedler's *Contingency Theory*. Nebel and Stearns surveyed 594 employees of 66 hospitality organizations in New Orleans. The employee group was young, had been employed for a short time period, and many had not completed high school. Turnover for the organizations was 94% annually. The jobs were highly structured and supervisors exerted an average amount of power. Employees were generally satisfied with their jobs and had a moderate need for

independence although black employees were significantly more dependent than were white. The findings of this study were that a task-oriented management style (directing and controlling) was most appropriate, especially when the employees were young, mostly untrained, with low education, and short job tenure. There was no support for a participative style although the authors identified situations in which a participative style is appropriate.

In the hospitality industry TQM was studied in a luxury hotel (Balacchino, 1995). This case study demonstrated the difficulty of execution of TQM. The author used semi-structured interviews and identified five reasons for the lack of success of this TQM program:

- There was an agenda trap in which there was a heavy emphasis on what needed to be accomplished but not on the results
- The supervisors were unable to modify their style
- A perquisite enjoyed by all employees became restricted to management only.
- There were structural difficulties including excessively low turnover, job insecurity, fear of turning the property into a timeshare, and a wave of redundancies causing cost-cutting.
- A perception on the part of employees that the company was anti-union.

A recent commentary in the hospitality literature suggested that a more participative style was important to improve a negative image of the industry. There was a perception that working conditions are less than ideal. Van Warner (1995) opined that quality of work life issues need to be addressed and management styles improved. "...the hostile managerial environment that still exists in many places must change. Only when team-oriented working environments based on respect replace dictatorial environments based on fear can positive change truly be realized (p. 83)."

INTELLECTUAL DEVELOPMENT OF STUDENTS

In the 1960s William Perry (1970) used qualitative methods to study many Harvard and

a few Radcliffe students over the course of their undergraduate careers. Using multiple open-ended interviews Perry and his associates developed a model of intellectual development which considered the student's orientation to learning and to authority. The model included nine positions in which a student could be located. The earliest position was considered to be a dualist in which the student assumed that most questions have a right and wrong answer and that problems are soluble by adherence to authority (Weiss, 1996). The professor was an authority who knew the truth and the student's responsibility was to memorize and write the correct answer on tests. Positions 2, 3, and 4 were considered to be multiplicity (Perry, 1970), that is knowledge was merely a matter of opinion and professors are people with opinions. Multiplist students believed that their opinions were as valid as the professor's opinions (Weiss, 1996). Positions 5 and 6 were relativism based on procedural knowledge (Perry, 1970). In these positions knowledge was based on complexities which are influenced by the context and professors were resources to provide ways of inquiring and analyzing. Students in these positions used evidence to support various answers. The final positions, 7, 8, and 9, were thought to be commitment in relativism/ constructed knowledge (Weiss, 1996). In these positions students believed that knowledge consisted of an integration of complexities with their personal views and experiences. The professor became one of many sources of information and methods. Students in these positions could support several answers but formed a commitment to one which they thought was the best.

Moore and Finch developed a *Learning Preference Inventory* (Woods 1994) which measured the position of students based on Perry's model of intellectual and ethical development. This instrument reduced the nine positions of Perry to five positions; dualist, transition, multiplist, transition, and relativist.

EDUCATING STUDENTS TO BE MANAGERS

McGregor (1960) believed that there were several classroom techniques which could

help improve problem-solving skills including the case method of teaching, role playing, exposure to others who had encountered similar situations, and having clinics where managers who were experiencing similar problems would meet together with a "teacher" who could help to sort out an array of solutions. McGregor also indicated that social interaction skills were important to acquire although these were harder to transmit because of the individual's previous learning of a repertoire of possibly ineffective behaviors. He had been involved with the National Training Laboratory for Group Development in which groups learned about their own behavior in relationship to the group. This training involved both practice and feedback. McGregor in 1960 did not believe that there would be a speedy movement from organizations whose predominate relationships were between individuals to organizations where the relationships were between groups. But he did feel that the latter was inevitable.

Johnson, Maruyama *et al.* (1981) reviewed 122 studies using three meta-analysis techniques and developed four propositions related to the effect of cooperative, competitive, and individualistic goal structures on productivity and achievement. They proposed that cooperation was superior to competition and to individualistic efforts in promoting achievement and productivity. For the cooperation vs. competition comparison, the effect was greater if a group product was required, if group members encouraged and tutored each other, and if group members cognitively rehearsed material. These results were valid for all age groups although pre-college was stronger than college, and for all subject areas for tasks involving "...concept attainment, verbal problem-solving, retention and memory, motor performance, and guessing-judging-predicting (p. 57)." For the cooperation vs individualistic efforts the effect was most noted in shorter studies and the results were valid for all subject areas and age groups. The authors offered tentative support to the proposition that "Cooperation without intergroup competition promoted higher achievement and productivity than cooperation with intergroup competition (p. 57)."

There was no significant difference between interpersonal competitive and individualistic efforts. These findings were thought to be useful for both education and industry.

Business schools, concerned that their curricula lacked relevance in the existing business environment, reviewed their Masters in Business Administration (MBA) programs (Muller, Porter, and Rehder, 1991; *The Best B Schools*, 1992; Deutschman, 1991; Greising, 1989). There was agreement that the graduates of MBA programs although theoretically strong were not creative and visionary, with high standards and ethically well-grounded. Some said that business schools ignored the quality revolution of the 1980's, and that business school graduates "...lack creativity, people skills, aptitude for teamwork, and the ability to speak and write with clarity and conciseness..." (Deutschman, 1991, p. 68.) There was concern that the strategy, structure, and curricula of most business schools taught anachronistic values and methods (Muller, Porter and Rehder, 1991). In most business schools students valued grades and a high-paying job with no real sense of the intrinsic value of learning. Some business schools were adding role playing, interaction games, and team work drills (Greising, 1989). In addition faculty at business schools were faulted for the reductionist nature of their research (Muller, Porter and Rehder, 1991). These authors noted that European business programs adapted to the changing global realities before the US universities. Europe had created new models of business schools which had an international focus and emphasized leadership and group process using action or experience learning. These programs collaborated extensively with business organizations.

Faculty in academic programs in both dietetics and hospitality are interested in knowing the relevance and appropriateness of the education being provided. Student satisfaction with dietetics education was studied based on programs accredited under the Essentials of Education (a process-oriented measure) and the newer Standards of Education (an outcome-based measure) (Oring and Plihal, 1993). Q-methodology was used to measure individual

attitudes in this case study. Oring and Plihal found students were less satisfied with programs developed under the newer outcome-based methods than with the process-based curricula.

Two studies investigated desired qualities of dietitians employed in business and industry. In a study of employers the most desired skills were communication, creativeness, problem-solving capabilities, and research skills (Kirk, Shanklin and Gorman, 1989). Dietitians actually employed in business and industry (B&I) identified a greater need for management, communication, and listening skills (Boudreaux, Shanklin and Johnson, 1991). B&I dietitians believed that important attributes were self-confidence, flexibility, strong work drive, initiative, and common sense. Respondents also noted that the undergraduate and graduate education available with the exception of an MBA did not prepare them for their positions and they needed to take responsibility for their own professional development.

There is an ongoing debate in the hospitality literature about the future of education in hospitality. Two authors identified skills that the Golden Nugget, a restaurant chain, could not provide in its training of managers and wished would be provided in an undergraduate education. "(A) broad general education in the arts, tourism and current events; a detail-oriented mind set that helps associates see a problem through to conclusion; and an ability to apply theory to everyday experiences (Jonker and Jonker, 1990)."

Knutson and Patton (1992) surveyed undergraduates in hospitality on their view of the importance of 15 competency areas and how well prepared they felt in each. A factor analysis was completed and four dimensions were identified related to a practical view of the future of the business, an ability to succeed within the corporate culture, effective communications, and the actual ability to operate a hospitality property. Only one student in five felt prepared overall. The authors noted that students had not learned to accept criticism. Students viewed an open management style on the part of their supervisors as important, but they did not think it happened in reality. Students were aware that they needed diverse skills, most importantly

in managing employees and interacting with guests. Also important were communication skills but students believed they already wrote well but were not skilled in public speaking.

Wisch (1991) entered the debate about a general education vs. careerism with the view that needed competencies in hospitality included "...mastery of interpersonal, communication, and problem-solving skills as well as a foreign language (p.66)." He also noted that students perceived that any courses not directly related to their career objectives were a waste of their time and faculty have done little to dissuade them from this belief. Wisch provided suggestions about integrating general education courses with career-oriented courses and indicated that programs ought to look at an assessment of the outcomes of the undergraduate curriculum. He noted that in the future there were likely to be more corporate sponsored education on the technical aspects. Universities are likely to provide fewer technical topics and more emphasis on teaching students how to think.

Powers and Riegel (1993) were optimistic about the future of hospitality education. Surviving programs would position themselves based on their identification of their clientele. These authors viewed the undergraduate education as offering theory and experiences which would allow the graduate to start out and grow. They believed that students needed real experience in working with people and that food laboratories were an excellent environment for learning about human relations and management style.

Lewis (1993) was less sanguine about the future of hospitality education programs. He indicated that the curricula had not changed and kept up with the future needs of the industry. Students should learn how to identify problems, to be innovative and creative, to integrate functional areas, and think globally. He identified needed changes including "soft skills" such as: "...leadership and teamwork; interpersonal skills, including speaking, writing, and negotiation; ethics; human resources; innovation and creativity; managing and using technology; globalization; quality management; and business as a complex whole instead of as

a set of disparate functions (p. 278).”

He asserted that hospitality programs needed to change their culture and focus on their customer, use new and different teaching styles, develop better teaching materials including textbooks, do more rigorous and relevant research.

Pavesic (1993) expressed concerns about the inability of graduates to think analytically and to transfer concepts between disciplines. He identified a need to continually upgrade knowledge. This author suggested that hospitality programs needed to become more traditionally academic and focus less on vocational or technical training.

Lambert and Riegel (1994) indicated that hospitality education programs assumed that problems the graduate encountered could be solved by direct application of learned theory. In fact many problems that confront graduates were ambiguous and needed to be solved without relying on learned protocols. They suggested reflective practica and situated cognition were methods which would allow students to learn to identify and solve previously unencountered situations. These authors recommended against teaching theory in isolation from practical experience.

Samenfink (1992) agreed and added that problems which will need to be solved in the future will require both textbook solutions along with creativity. Instead of management functions, programs should be teaching about team building and leadership to enable graduates to enhance empowerment of employees. Programs needed to do a better job of teaching critical thinking skills.

Knowing the problems that educational programs have is the first step. Steps that various programs have taken to improve teaching have been documented. Kapoor (1989) identified three types of goal structures, indicated when each should be used and provided examples within a hospitality program. These included cooperative structures which may be used for problem-solving, divergent thinking, and when creativity is desired. This goal structure

leads to the social development of students. Individualistic goal structure was used when a specific skill or series of facts needs to be learned. Competitive goal structures were rarely used and only when the goal was to review, drill, or achieve quantity on simple tasks.

Giroux (1989) trained 12 students to evaluate in-class activities for levels of Bloom's taxonomy. The students reviewed six courses over a four week period and identified the cognitive level being implemented. For four courses learning was at the lower order level (knowledge and comprehension) at least 96% of the time. For two classes higher order level (application, analysis, synthesis, evaluation) was employed 18% of the time.

Supporting all of these discussions about what undergraduate education should provide was the report of the Wingspread Conference (1994) which resulted from discussion among many stakeholders about the value of accreditation of colleges. An outcome of the conference was the consensus that undergraduate education needed to be improved and made more accountable. The three questions the conference set out to answer were:

1. What do we mean by quality?
2. What is appropriate and adequate evidence of quality?
3. How should evidence of quality be communicated?

The conference identified important characteristics of the graduate of an undergraduate program:

- technical competence in a given field;
- high level communications, computational, technological literacy, and informational abilities that enable individuals to gain and apply new knowledge and skills as needed;
- the ability to arrive at informed judgments - that is, to effectively define problems, gather and evaluate information related to those problems, and develop solutions;
- the ability to function in a global community, including knowledge of different cultural and economic contexts as well as foreign language skills;
- a range of attitudes and dispositions including: flexibility and adaptability; ease with diversity; initiative; motivation and persistence; ethical and civil behavior, as well as personal integrity; creativity and resourcefulness; and the ability to work with others, especially in team settings;
- and above all demonstrated ability to deploy all of the above to address specific problems in complex, real-world settings, and under 'enterprise conditions' in which the development of workable solutions is required (Wingspread, 1994).

INSTRUCTIONAL METHODS

McCleary and Weaver (1991) reported on a method to increase interaction in the classroom. High-involvement peer education (HIPE) included classroom teaching of subject matter by students in a small group and then re-teaching of the material to a second group by a learner. The authors found that the method forced student involvement and improved communication and leadership skills. The method was a time consuming process, however.

Ferreira (1992) defended the use of case study analysis even though this method had been attacked as too structured and implied that there was only one correct answer. Other criticisms were the emphasis of cases on crisis situations which good management practices would have avoided and the employment of reactive instead of proactive strategies. Ferreira suggested that cases and simulations were useful to encourage logic, they could challenge the student intellectually, and were goal oriented.

Gilmore (1992) used case studies in two classes. One class discussed cases as a class. Students involved in discussion had higher test scores. The author identified advantages in addition to better learning including opportunity to increase analytical, evaluative, and social skills through the discussion process.

PERSONALITY TYPE COMPARISON OF HOSPITALITY AND DIETETICS STUDENTS

Personality differences between hospitality and dietetics students may influence their satisfaction with teaching methods. Brymer and Pavesic (1990) used the *Myers-Briggs Type Indicator* with hospitality graduates to determine if there was a correlation between personality type and people who stayed in the industry. They found no difference in their study of 206 graduates. The two most common personality types of hospitality graduates found graduates who were extroverted and sensing, with either thinking or feeling, and judging.

In a study by Fox and Roberts (1993) a Myers-Briggs Inventory of 38 dietetics students (women), 44 hospitality students (women), and 33 hospitality students (men) found quite

different personality types. The female dietetics students preferred to receive information via their senses, liked practical applications, remembered things that had personal interest, completed assignments on time and were more empathetic. The recommendation for teaching this group was to include values clarification activities, people-oriented cases, and practica or work-study situations. The male hospitality students learned in an organized factual manner using their senses, liked multimedia, hands-on experiences, and situation-oriented cases studies. The female hospitality students resembled the dietetics students but not so strongly. On the thinking-feeling dimension, 71% of dietetics students were feeling, 82% of males were thinking, and 48% of female hospitality students were thinking.

PROBLEM-BASED LEARNING (PBL)

Problem-based learning was first developed in 1969 for medical students at McMaster University in Hamilton, Ontario for a variety of reasons (Pallie and Carr,1987).

- Formal medical education had become excessively long and detailed.
- There was an excess of teaching and learning without critical thinking. Students were taught at the same speed.
- The half life of medical knowledge is about five years so that approximately 50% what was learned in medical school was no longer correct upon graduation.
- Social problems and innovation were excluded.

Difficulties with traditional medical education related to information overload (Barrows, 1983).

Lectures had been viewed as very efficient in providing the greatest amount of information in the least amount of time. The students memorized facts in order to pass tests but much of the information was forgotten after passing the test. Skills that the medical profession viewed as crucial (clinical reasoning and problem solving) were not being taught.

The educational objectives of PBL in a medical school environment are to:

- "acquire knowledge base that should be better retained, usable in a clinical context,

- extended by future self-directed study, integrated from the many disciplines relevant to medicine;
- develop clinical reasoning (problem-solving) skills characteristic of the expert clinician;
 - develop self-directed learning skills;
 - encourage sensitivity to all of the patient's needs - medical and psychosocial;
 - provide a student-centered learning method that is motivating for the student, perceived as relevant to a career in medicine, capable of being individualized to the needs of each student;
 - encourage independent, critical thinking skills (Barrows, 1983 p. 3078)."

An extensive review of the literature on PBL by Norman and Schmidt (1992) indicated that there was no evidence that PBL resulted in improvement in content-free problem solving skills. PBL may have had short-term reduced levels of learning but, over years, there was likely to be increased retention. PBL enhanced long-lasting self-directed learning, increased student motivation, and was more stimulating than a conventional program. Other articles indicated the value of PBL in medical education (Barrows and Tamblyn, 1976; Levinson, Fawkes, *et al.*, 1977; Lambie, Maclean, & McGuire, 1981), dental education (Tedesco, 1990), nursing education (Rideout, 1994; Ryan, 1993), occupational therapy education (Busuttil, 1988; Saldo, Piper and Agnew, 1994), law education (Moust, DeVolder & Nuy, 1989), dietetics education (Van Dieijen, 1990).

Wilkerson and Feletti (1989) suggested the multiple ways in which PBL can be incorporated: small groups with a tutor, collaborative learning groups, case method, case-based teaching, inquiry labs, and independent study. Barrows (1986) provided a taxonomy of methods of PBL which included lecture-based cases, case-based lectures, case method, modified case-based, problem-based, and closed-loop problem-based varieties. The varieties used different strategies to incorporate structuring of knowledge, development of effective clinical reasoning process, development of effective self-directed learning skills, and increased motivation for learning. Walton and Matthews (1989) indicated there was no real agreement of what constituted problem-based learning.

Most of the medical school models of PBL included the use of a tutor. There was

discussion about whether the tutor needed to be a content expert, an expert in PBL, or both. Schmidt, Arend, *et al.* (1993) found that tutorial groups with a content-expert were better achievers and spent more time on self-directed learning.

A study at Harvard Medical School of first year medical students comparing lecture method and PBL showed that students learned equally well with either method. Incoming students were asked which method of instruction they would prefer (Moore, 1991). All students were taught by both methods. Academic performance as measured by examination scores using multiple choice questions, essays, and problem-solving tests were identical regardless of which method of instruction the student preferred initially. Students preferred the courses which used the learning method originally requested. After the year-long program, students were asked which learning method they now preferred. Students who initially preferred PBL did not change their preference but many students who initially selected lecture method switched to preferring the PBL method.

One important aspect of PBL is the generation of learning issues. Programs outside of the US using PBL tend to utilize more student-generated learning issues whereas the seven US programs using PBL, both faculty and student-generated learning issues were used (Blumburg, Michael & Zeitz, 1990). The authors suggested that this type of curriculum is less effective in helping students become independent, self-directed learners than more "classical" PBL programs.

In a study conducted at the University of Limburg a comparison was made between the overlap of faculty objectives for the problems and student issues. Only 64% of faculty objectives were identified as student learning issues. Student issues seemed to be based on what students wanted and needed to know (Dolmans, Gyselairs, *et al.*, 1993).

The implementation of PBL in a curriculum requires inclusion of faculty who may not have volunteered. Faculty in an Australian Medical school indicated they were comfortable

with this approach (Neame, 1982). When Harvard Medical School implemented PBL they studied non-volunteers and found faculty thought PBL to be a practical approach whose benefits outweighed the costs (Maxwell and Anderson, 1990).

OUTCOMES OF PBL EDUCATION

Fifteen studies comparing outcomes of problem-based programs and conventional curricula in medical schools reviewed student's academic achievement, clinical competence, career preferences, perceptions of educational environments, and learning styles (Schmidt, Dauphinee & Patel, 1987). A small difference in knowledge favored the conventional curricula in some of the reported studies. In one study conducted by Dutch investigators progress tests were administered four times each year for the six years of medical school programs. There were differences at various points in the curricula but by the sixth year the differences between the conventional and PBL students had vanished. Several studies suggested that PBL students performed somewhat better in clinical competence than the conventional students. An emphasis on becoming primary care physicians along with independent, self-directed learning characterized PBL students. In one study students in PBL courses indicated that they used a deep-level approach to their learning. Conversely, short-term learning and memorization and a strategic goal of only passing examinations was typical of students in the conventional program. Student perceptions of the experience were measured in some of the studies. Some students perceived that the learning environment of the PBL curriculum was more flexible and meaningful with a better emotional climate. It is difficult to draw clear conclusions about the effects of the two curricula.

A meta-analysis of the English-language literature from 1972 to 1992 was conducted by Albanese and Mitchell (1993). They set out to answer five research questions.

- "What does PBL cost compared with conventional lecture-base instruction?"

- Do PBL student develop the cognitive scaffolding necessary to easily assimilate new basic sciences information?
- To what extent are PBL students exposed to an adequate range of content?
- Do PBL student become overly dependent on a small-group environment?
- Do faculty dislike PBL because of the concentrated time commitment required?" (p. 55)

These authors reviewed over 100 articles about PBL and found many studies supportive of the method along with some areas of concern.

- Outcomes of PBL indicated that PBL students probably will not do as well as conventional students in basic science. But PBL students appeared to do better on clinical examinations. There was concern that PBL students might not develop cognitive structure adequately. PBL students tended to study differently than did conventional students and were likely to use more library resources. PBL students seemed less stressed in some studies than conventional students. PBL students reported enjoying their learning more although it was suggested that 4% to 20% of students would not do well in a PBL environment.
- Clinical ratings were either more positive or not different for PBL graduates as compared with traditional graduates. These studies, however, did not allow the authors to make conclusions about the effect of curriculum on graduates' performance. The trend is for PBL graduates to select family medicine certification but the distribution of the graduates did not really resolve labor needs because PBL trained doctors did not select rural or solo practices more than conventionally-trained doctors.
- Concern about costs of a PBL program appeared warranted according to many studies especially in large medical school. Additionally PBL curricula covered 82% of the material covered in conventional curricula. This coverage could be increased if faculty tutors were more directive.

In sum, this meta-analysis indicated that there were concerns with the first four hypotheses and these factors needed to be addressed when PBL was considered for medical school

programs.

A study on problem solving skills of students educated by either conventional or PBL methods showed significant differences between the students (Patel, Groen & Norman, 1991). PBL students learned a systematic method of reasoning and organizing clinical information, used backward reasoning, and were able to elaborate extensively. Conventional students also showed a systematic process of thinking, but did not use extensive elaboration, and used a more forward pattern of reasoning. PBL students had more errors in their more extensive elaborations, possibly due to inexperienced tutors.

Testing of students using problem-based criterion referenced examination methods in contrast to a traditional written examination was found to be feasible (Newble, Elmslie and Baxter, 1978).

Students at the University of New Mexico school of Medicine could choose a conventional or a PBL program (Mennin, Friedman, *et al.*, 1993). Results on the national examinations for physicians (NBME) which were offered in three parts showed that conventional students from the New Mexico program scored higher on NBME I, demonstrated little difference on NBME II, and the PBL students scored better on NBME III.

Tomczak (1991) compared six sections of the national boards (including clinical skills, knowledge, interpersonal qualities, and self-directedness) for podiatry students who were educated either by the traditional lecture method or PBL. There were no differences in knowledge on four sections of the national boards and students from the lecture method scored higher in one section. Students from the PBL section scored higher in interpersonal qualities and were also placed in desired residencies significantly better than students in the lecture-based method.

Scolari (1992) compared lecture-based (LB) method and PBL for first year medical students to determine information needs and how resources were used. She found that PBL

students used information from a wider variety of sources and self-selected more resources than did LB students.

Bayard (1994) compared PBL and LB for dietetic undergraduate students (UGS) and dietetic interns (DI). She found PBL students more likely to use a wider variety of resources but there were no increases in retention, self-directed learning skills, or motivation level for UGS. Use of memorization decreased with PBL, reflective thinking increased for PBL UGS, but confidence in problem solving did not increase for UGS. DI did increase self-directed learning skills and confidence in problem solving. DI also reported less stress and frustration with PBL than did UGS. The author recommended PBL for DI and for UGS if time can be provided to reduce concerns about both knowledge expected to be acquired and how grades will be assigned.

Stodart (1994) identified problems with tutors who lacked the ability to provide adequate feedback to students, and who did not have adequate skills to tutor. She indicated that an educator felt that self-directed learning was not effective with first year nursing students because of their lack of maturity and experience

Norman (1988) indicated that the academic outcomes of the lecture method and PBL are substantially the same. The major difference between the two methods for medical students is that PBL students enjoy themselves in the learning process. He suggested that the lack of a difference in learning may be that the measures used to test learning are inadequate. Norman indicated a feature which caused the finding of small differences between experts and students is small sample size in the studies. But even if a large sample was used, during the hypothesis generation phase of the study the focus on measurement would ensure a likelihood of confirmatory biases which would cause the investigator to miss critical differences in performance.

The literature for both participative management and Problem Based Learning reflect the idea that using groups to study and solve problems is an effective way of learning and working. In both areas the decisions are likely to be improved, both students and employees are more satisfied with the experience, and productivity may be enhanced.

CHAPTER III

METHODOLOGY

STATEMENT OF THE PROBLEM

The purpose of this research is to test whether a new teaching method, Problem-Based Learning, will enhance the likelihood that students who are studying to become dietitians or hospitality managers will employ participative management styles. The management literature emphasizes needed skills of managers include problem-solving, creativity, communication, and team building. The education literature indicates that cooperative learning enhances these attributes. It seemed logical to suggest that using Problem-Based Learning as the primary teaching method would encourage students to implement a more participative style of management. Additionally, this research seeks to investigate whether teaching method affects the learning achieved and students' evaluations of a course in Quantity Food Production and Service.

PILOT STUDY

The learning objectives of the course Quantity Food Production and Service were used to develop 15 problems which served as the stimulus for students to retrieve and structure what they already knew, and to investigate the appropriate literature and other resources. A sample problem is illustrated in Figure 1. These problems were reviewed by practitioners and educators in foodservice systems management and the Center for Teaching Effectiveness, University of Delaware, and were revised based on their suggestions. In the Fall of 1994 students registered for one of two sections of the class without knowledge that the method of instruction was different. Both classes were offered at 8:00 AM, the lecture-based (LB) method on Tuesday/Thursday and the Problem-Based Learning (PBL) method on Wednesday/Friday. The learning objectives and textbook were identical. The textbook used

JACK IN THE BOX - Part I'

In May of 1992 Bremerton-Kitsap County Health Department in the State of Washington sent a bulletin to all operators of foodservice facilities identifying new standards for the production of hamburgers. The bulletin was the result of a change in Washington State Health Policy in March of 1992 which was widely publicized. A major requirement was that hamburgers be cooked to an internal temperature of 155 degrees F.²

In early January of 1993 a large number of cases of foodborne illness were diagnosed in and around Washington State. By January 15th there were over 150 people sick, most of them children and one child had already died. What all of the sick people had in common was that they had eaten hamburgers obtained from Jack in the Box restaurants. It was discovered that there was a bacterial cause for the food infection. Symptoms of the disease included bloody diarrhea. Microbiological and chemical studies revealed the presence of *Escherichia coli* O157:H7 in samples of the ground beef patties and in samples taken from the victims of the outbreak. Eleven lots of hamburger patties were recalled but the ultimate source was never found.

Foodmaker, Inc. was the operator of two concepts, Jack In the Box Restaurants and Chi Chi's. Foodmaker had 55 company owned and 10 franchised Jack in the Box restaurants in Washington State. Initially executives of the corporation which is located in San Diego, California indicated they had not received notice of the higher temperature requirement. Chuck Duddles, executive vice president and chief financial officer of Foodmaker indicated as reported in the Wall Street Journal, "We are not expected to be experts on disease. We have to depend on the experts at the (D)epartment of (A)griculture to set the standards. We are not a research firm." Operating procedures in Jack in the Box stores required that hamburgers be cooked to an internal temperature of 140 degrees F which was the recommended temperature by the Food and Drug Administration in 1993.³

QUESTIONS:

1. What symptoms would be expected in foodborne illness?
2. How did *E.coli* O157:H7 get into the hamburgers? How do contaminants get into food?
3. What environmental conditions allow bacteria to grow in foods?
4. How does food infection differ from food poisoning?
5. Should operators of foodservice facilities be "experts on disease" or is this someone else's job?
6. Since the operating procedures included the recommended cooking temperatures from the Food and Drug Administration, do you feel that Foodmaker was or was not liable for the foodborne illness? Justify your answer.

References:

1. Holden BA. State says chain involved in outbreak didn't comply with new cooking rule. Wall Street Journal, January 25, 1993.
2. Holden BA. Foodmaker delays expansion plans in wake of food poisoning outbreak. Wall Street Journal, February 16, 1993.
3. Gibson R, Kilman S. Tainted hamburger incident heats up debate over U.S. meat-inspection system. Wall Street Journal, February 12, 1993.

Figure 1: Sample Problem

was West and Wood: *Introduction to Food Service*, 7th ed. NY: Macmillan Publishing Company, 1994.

Students in LB had 26 one and one quarter hour classes. Classes consisted primarily of the faculty member providing detailed lectures using overhead visuals and some video presentations. Students were able to purchase a packet which contained the overheads to be used for the semester. Requirements for the class included submission of six abstracts of articles from the current literature, two group projects (a prospectus and a menu for a theoretical foodservice organization), three quizzes, two hour exams, and a final exam.

Students in PBL had the same total class hours. The class consisted of students working together in groups on the problems sequentially. Heterogeneous groups of six were organized by the instructor based on major, gender, self-reported grade point average, and previous experience in groups. The faculty member and an undergraduate teaching assistant rotated through the groups and functioned as a tutor in each group. There were identified roles for each member of the group (discussion leader, recorder, reporter, focuser, encourager, accuracy coach). These roles were rotated throughout the semester. The reporter submitted the written report of each problem for a group grade. Peer evaluations comprised part of the final grade. Three problems were used as hour exams (2) and as a component of the final exam. Individual responses were written based on group discussion for two class sessions prior to the exam.

DATA COLLECTED

Informed consent was requested to allow access to student records. Collected information included major, grade point average (GPA), and gender.

A pre-test of knowledge of nutrition and food science was administered to each section and is illustrated in Figure 2. In the PBL section the students were encouraged to discuss the test among themselves and the test was re-administered after 10 minutes of discussion.

UNIVERSITY OF DELAWARE
DEPARTMENT OF NUTRITION AND DIETETICS
NTDT 321 - QUANTITY FOOD PRODUCTION AND SERVICE

PRE-TEST

1. In order to prevent enzymatic oxidative browning in cut fruit, dip the cut fruit in ____.
 - A. lemon juice
 - B. pineapple juice
 - C. sulfite solution
 - D. All of the above
 - E. A or B only

2. When food is treated with mild heat to destroy pathogens, but not all microorganisms, the food has been ____.
 - A. sterilized
 - B. sanitized
 - C. cleansed
 - D. pasteurized

3. Salmonellosis is an example of a foodborne disease categorized as a ____.
 - A. ptomaine poisoning
 - B. food infection
 - C. food intoxication
 - D. All of the above
 - E. B and C only

4. A method of heat transfer in which heat is transmitted from one molecule or particle to the next one in direct contact with it.
 - A. Conduction
 - B. Convection
 - C. Radiation
 - D. Induction

5. The changes which occur when starch is subjected to moist heat.
 - A. Oxidation
 - B. Catalyst
 - C. Gelatinization
 - D. Polysaccharide

6. Yellow-orange fat-soluble pigments found in some vegetables which are relatively stable during normal cooking processes.
 - A. Chlorophyll
 - B. Carotenoid
 - C. Anthocyanin
 - D. Betalain
 - E. Anthoxanthin

Figure 2: Pre-Test of Knowledge of Nutrition and Food Principles

7. The least tender cuts of beef are:
 - A. Chuck, rump, round
 - B. Rib, short loin, sirloin
 - C. Flank, plate, brisket, neck, shanks
 - D. All are equally tender

8. From one pound of boneless rib roast you could expect to get _____ cooked 3 ounce portions.
 - A. 2
 - B. 3
 - C. 4
 - D. 5
 - E. 6

9. The recommended roasting temperature for meat is _____.
 - A. 450 degrees F
 - B. 375 degrees F
 - C. 325 degrees F
 - D. 275 degrees F
 - E. Depends on the size of the roast

10. The flour with the highest amount of gluten is ____ flour.
 - A. all-purpose
 - B. pastry
 - C. bread
 - D. cake

11. A flour mixture thick enough to be handled or kneaded on a board is a _____.
 - A. sponge
 - B. dough
 - C. batter
 - D. All of the above

12. In which bakery product does over stirring cause peaks and tunnels in the finished product?
 - A. Muffins
 - B. Biscuits
 - C. Cookies
 - D. Whole wheat bread

13. When flour and fat are combined in equal parts and heated, the resulting mixture is a _____.
 - A. sauce
 - B. gravy
 - C. stock
 - D. roux
 - E. pudding

14. Generous dietary sources of carbohydrate would not include:
- A. Tuna fish
 - B. Pasta
 - C. Bread
 - D. Potatoes
 - E. Milk
15. The protein and fat content of the average adult American's diet is:
- A. well below recommended amounts to maintain good health.
 - B. slightly less than desirable.
 - C. just about right.
 - D. slightly more than required for good health.
 - E. well in excess of needed amounts for good health.
16. Potent, indispensable, noncaloric organic compounds, needed in small amounts in the diet, which perform specific and individual functions to promote growth or reproduction or to maintain health and life.
- A. Amino acids
 - B. Fats
 - C. Vitamins
 - D. Minerals
17. The current recommended way to assure that an individual consumes an appropriate diet is:
- A. Follow the Basic 4 Food Groups
 - B. Conform to the Food Guide Pyramid
 - C. Eat three meals a day
 - D. Consume a multi vitamin tablet each day
18. Which of the following is not a carbohydrate?
- A. sucrose
 - B. fructose
 - C. glycogen
 - D. gelatin
 - E. starch
19. The food which is lowest per serving in calcium is ____.
- A. yogurt
 - B. skim milk
 - C. bananas
 - D. spinach
 - E. oysters
20. Absence of which type of nutrient would cause death first?
- A. Water
 - B. Vitamins
 - C. Protein
 - D. Fat
 - E. Minerals

21. Iron is lowest in quantity in ____.
- A. milk
 - B. meat
 - C. vegetables
 - D. bread
 - E. legumes
22. Flour or rice which is enriched has had ____, thiamin, riboflavin and niacin added back to the white product.
- A. calcium
 - B. iron
 - C. vitamin A
 - D. vitamin C
 - E. magnesium

A learning environment survey (LES) (Woods, 1994), illustrated in Figure 3, was administered both at the beginning and the end of the course. This survey consisted of 28 statements which identified characteristics of learning environments. Students selected the ten statements which best described their ideal learning environment. In addition, students reported on the back of the LES administered at the end of the course how adequately the particular instructional method met their ideal environment. There were five categories of learning environment represented in the survey. These range from Position 1 (dualist) representing a teacher-centered classroom with students taking little responsibility for their learning to Position 5 (relativist) representing a student-centered classroom where students take major responsibility for their learning.

Attendance was taken for each session.

The Instructional Development and Effectiveness Assessment evaluation instrument (IDEA, 1991), illustrated in Figure 4, was used in both classes. IDEA is a nationally referenced instrument which allows comparison with courses from similar disciplines offered at many other institutions.

For the purpose of comparing the knowledge of the two sections there was a common component of the final exam for both sections, illustrated in Figure 5. This was a blue book essay exam of eight questions worth 35 points (one third of final exam total points for LB and one half of final exam total points for PBL). Students selected five of the eight questions to answer. Exams from both sections were intermingled. All exams were graded blind by the faculty member. That is the student's names were hidden until after grading was completed.

Students submitted anonymously their reaction to the learning process both on the IDEA form and to a consultant from the Center for Teaching Effectiveness.

IMPORTANT!

IDEA SURVEY FORM -- STUDENT REACTIONS TO INSTRUCTION AND COURSES

Your thoughtful answers to these questions will provide helpful information to your instructor.

Describe the frequency of your instructor's teaching procedures, using the following code:

1--Hardly Ever 2--Occasionally 3--Sometimes 4--Frequently 5--Almost Always

The Instructor:

1. (1) (2) (3) (4) (5) Promoted teacher-student discussion (as opposed to mere responses to questions).
2. (1) (2) (3) (4) (5) Found ways to help students answer their own questions.
3. (1) (2) (3) (4) (5) Encouraged students to express themselves freely and openly.
4. (1) (2) (3) (4) (5) Seemed enthusiastic about the subject matter.
5. (1) (2) (3) (4) (5) Changed approaches to meet new situations.
6. (1) (2) (3) (4) (5) Gave examinations which stressed unnecessary memorization.
7. (1) (2) (3) (4) (5) Spoke with expressiveness and variety in tone of voice.
8. (1) (2) (3) (4) (5) Demonstrated the importance and significance of the subject matter.
9. (1) (2) (3) (4) (5) Made presentations which were dry and dull.
10. (1) (2) (3) (4) (5) Made it clear how each topic fit into the course.
11. (1) (2) (3) (4) (5) Explained the reasons for criticisms of students' academic performance.
12. (1) (2) (3) (4) (5) Gave examination questions which were unclear.
13. (1) (2) (3) (4) (5) Encouraged student comments even when they turned out to be incorrect or irrelevant.
14. (1) (2) (3) (4) (5) Summarized material in a manner which aided retention.
15. (1) (2) (3) (4) (5) Stimulated students to intellectual effort beyond that required by most courses.
16. (1) (2) (3) (4) (5) Clearly stated the objectives of the course.
17. (1) (2) (3) (4) (5) Explained course material clearly, and explanations were to the point.
18. (1) (2) (3) (4) (5) Related course material to real life situations.
19. (1) (2) (3) (4) (5) Gave examination questions which were unreasonably detailed (picky).
20. (1) (2) (3) (4) (5) Introduced stimulating ideas about the subject.

On each of the objectives listed below, rate the progress you have made in this course compared with that made in other courses you have taken at this college or university.

In this course my progress was:

- 1-Low (lowest 10 percent of courses I have taken here)
- 2-Low Average (next 20 percent of courses)
- 3-Average (middle 40 percent of courses)
- 4-High Average (next 20 percent of courses)
- 5-High (highest 10 percent of courses)

Progress on:

21. (1) (2) (3) (4) (5) Gaining factual knowledge (terminology, classifications, methods, trends).
22. (1) (2) (3) (4) (5) Learning fundamental principles, generalizations, or theories.
23. (1) (2) (3) (4) (5) Learning to apply course material to improve rational thinking, problem-solving and decision making.
24. (1) (2) (3) (4) (5) Developing specific skills, competencies and points of view needed by professionals in the field most closely related to this course.
25. (1) (2) (3) (4) (5) Learning how professionals in this field go about the process of gaining new knowledge.
26. (1) (2) (3) (4) (5) Developing creative capacities.
27. (1) (2) (3) (4) (5) Developing a sense of personal responsibility (self-reliance, self-discipline).
28. (1) (2) (3) (4) (5) Gaining a broader understanding and appreciation of intellectual-cultural activity (music, science, literature, etc.).
29. (1) (2) (3) (4) (5) Developing skill in expressing myself orally or in writing.
30. (1) (2) (3) (4) (5) Discovering the implications of the course material for understanding myself (interests, talents, values, etc.).

On the next four questions, compare this course with others you have taken at this institution, using the following code:

1--Much Less than Most Courses 2--Less than Most 3--About Average 4--More than Most
5--Much More than Most

The Course:

31. (1) (2) (3) (4) (5) Amount of reading.
 32. (1) (2) (3) (4) (5) Amount of work in other (non-reading) assignments
 33. (1) (2) (3) (4) (5) Difficulty of subject matter.
 34. (1) (2) (3) (4) (5) Degree to which the course hung together (various topics and class activities were related to each other)

Describe your attitudes toward and behavior in this course, using the following code:

1--Definitely False 2--More False than True 3--In Between 4--More True than False
5--Definitely True

Self-rating:

35. (1) (2) (3) (4) (5) I worked harder on this course than on most courses I have taken.
 36. (1) (2) (3) (4) (5) I had a strong desire to take this course
 37. (1) (2) (3) (4) (5) I would like to take another course from this instructor.
 38. (1) (2) (3) (4) (5) As a result of taking this course, I have more positive feelings toward this field of study.
 39. (1) (2) (3) (4) (5) Leave this space blank. Continue with question A.

For the following questions, A-G, indicate how descriptive each statement is by blackening the proper space.

1--Definitely False 2--More False than True 3--In Between 4--More True than False
5--Definitely True

- A. (1) (2) (3) (4) (5) The instructor gave tests, projects, etc., that covered IMPORTANT POINTS of the course.
 B. (1) (2) (3) (4) (5) The instructor gave projects, tests, or assignments that required ORIGINAL OR CREATIVE THINKING.
 C. (1) (2) (3) (4) (5) I really wanted to take a course FROM THIS INSTRUCTOR.
 D. (1) (2) (3) (4) (5) I really wanted to take this course REGARDLESS OF WHO TAUGHT IT.
 E. (1) (2) (3) (4) (5) Overall, I rate this INSTRUCTOR an excellent teacher.
 F. (1) (2) (3) (4) (5) Overall, I rate this an excellent COURSE.
 G. (1) (2) (3) (4) (5) Overall, I LEARNED A GREAT DEAL in this course.

EXTRA QUESTIONS:

If your instructor has extra questions, answer them in the space designated below (questions 40-64).

40. (1) (2) (3) (4) (5)
 41. (1) (2) (3) (4) (5)
 42. (1) (2) (3) (4) (5)
 43. (1) (2) (3) (4) (5)
 44. (1) (2) (3) (4) (5)
 45. (1) (2) (3) (4) (5)
 46. (1) (2) (3) (4) (5)
 47. (1) (2) (3) (4) (5)
 48. (1) (2) (3) (4) (5)
 49. (1) (2) (3) (4) (5)
 50. (1) (2) (3) (4) (5)
 51. (1) (2) (3) (4) (5)
 52. (1) (2) (3) (4) (5)
 53. (1) (2) (3) (4) (5)
 54. (1) (2) (3) (4) (5)
 55. (1) (2) (3) (4) (5)
 56. (1) (2) (3) (4) (5)
 57. (1) (2) (3) (4) (5)
 58. (1) (2) (3) (4) (5)
 59. (1) (2) (3) (4) (5)
 60. (1) (2) (3) (4) (5)
 61. (1) (2) (3) (4) (5)
 62. (1) (2) (3) (4) (5)
 63. (1) (2) (3) (4) (5)
 64. (1) (2) (3) (4) (5)

Your comments are invited on how the instructor might improve this course or teaching procedures.
 Use the space below for comments (unless otherwise directed.)
 Note: Your written comments will be returned to the instructor.
 You may want to PRINT to protect your anonymity.

Institution:

Instructor:

Course No.:

Time and Days Class Meets:

UNIVERSITY OF DELAWARE
COLLEGE OF HUMAN RESOURCES
DEPARTMENT OF NUTRITION AND DIETETICS
QUANTITY FOOD PRODUCTION AND SERVICE

FINAL EXAM

NAME _____

USE A BLUE EXAMINATION BOOK

NINE POINT QUESTIONS - CHOOSE THREE TO ANSWER

1. Describe the four types of foodservice production systems. Include detail about where the food is prepared in relation to where it is served, the time span between preparation and service and the form of foods purchased for production.
2. Discuss the factors which would be considered in menu planning to achieve the goals of the foodservice organization.
3. Discuss the principal methods of purchasing needed goods for a foodservice organization. Include a description of some of the major variations or alternate buying arrangements. Include advantages of each method.
4. Discuss the management tools available to control food production. Include detail on how each is developed and used within a foodservice organization.
5. Discuss how a manager of a foodservice organization could diminish the risk of causing an outbreak of food borne illness. Provide detail about the steps which should be taken.

FOUR POINT QUESTIONS - CHOOSE TWO TO ANSWER

6. Discuss the variety of methods of waiter/waitress service available. Give examples of where each may be used.
7. Discuss the available options to rethermalize meals prepared in a ready foods system to the appropriate service temperature in a tray delivery system.
8. Distinguish between a food borne infection and a food borne intoxication. Provide specific examples of agents or organisms which may be implicated.

Figure 5: Final Examination Questions - Pilot Study - Fall 1994

RESEARCH STUDY

In the Fall semester of 1995 students registered for one of two sections of the class Quantity Food Production and Service. LB met on Tuesday/Thursday at 8:00 AM for 1 1/4 hours. PBL met on Monday/Wednesday/Friday at 8:00 AM for 50 minutes. Methods of instruction duplicated the pilot study. The textbook used was Spears M.C., *Foodservice Organizations*, 3rd ed., NY: Macmillan Publishing Company, 1995. Based on feedback from the pilot study and a subsequent offering of the PBL class, course expectations were increased with the addition of 11 worksheets based on chapters in the required textbook to be completed by each student, illustrated in Figure 6. Hour tests in the PBL section included both a problem write up and two brief essays on a choice of topics. A component of the final exam for each section was five essay questions to be answered of eight offered, illustrated in Figure 7. All tests were again intermingled and graded blind. Twenty of the 90 tests were also graded by a second faculty member blind to validate grading criteria.

DATA COLLECTED

The pilot study was replicated with the exception of the LES. This instrument was replaced with the Propensity for Participative Management (PPM) (Parnell, *et al.*, 1992) which was administered both as a pre-test and post-test, illustrated in Figure 8. In order to validate the PPM instrument for dietetics and hospitality students, the instrument was mailed to 500 members of the National Restaurant Association (NRA) living in Delaware and New Jersey and 500 members of the dietetic practice group, Management in Health Care Systems, of the American Dietetic Association (ADA), illustrated in Figure 9. The mailing lists were obtained from the respective organizations. The cover letter to professionals which described the purpose of the study is illustrated in Appendix A.

Demographic information was collected about each student. Information was collected about their current or most recent employment including the type of organization, length of

5. Why are critical control points especially important in commissary foodservice and ready prepared foodservices?

6. Describe the flow of food including the processing which would occur to produce spaghetti sauce from relatively unprocessed ingredients in a ready prepared foodservice. Use a flow diagram if desired. [Do not open up a jar of Ragu and heat.]

7. How is it possible to reduce the cost of labor by using a ready prepared foodservice instead of a conventional foodservice?

8. How would the costs associated with preparing and serving a meal be different in an assembly/service foodservice from a conventional foodservice. [Consider the cost of food, labor, equipment.]

9. Is there likely to be a difference in the quality of the same food produced by each of the various alternative foodservice methods? Are some products really not practical for one or more of the different systems?

UNIVERSITY OF DELAWARE
DEPARTMENT OF NUTRITION AND DIETETICS
QUANTITY FOOD PRODUCTION AND SERVICE

FINAL EXAM

NAME _____

CHOOSE ANY FIVE QUESTIONS TO ANSWER. EACH QUESTION WORTH 6 POINTS

1. Compare and contrast any two of the four production subsystems. Describe each thoroughly including information about raw ingredients, production, when and how completed product is held/stored, and comparisons of food cost, labor cost, and equipment cost.
2. Completely describe one microorganism capable of causing foodborne illness. Discuss the types of foods likely to become contaminated, how the food becomes contaminated, and what symptoms are likely to be experienced.
3. Describe the information which would be important to consider when planning a menu for a non-commercial foodservice organization.
4. Describe three tools which are available to a foodservice manager to control food production.
5. Develop a list of major equipment needed to produce the following menu for an industrial cafeteria which serves around 1000 meals at lunch. Assume all products are made from relatively unprocessed food ingredients, not convenience foods. List each menu item and all of the most appropriate major pieces of equipment beside it.

Barbecued Pork Sandwich (purchase the roll)
Macaroni and Cheese
Hamburger (purchase the roll)
Chicken Salad
Seasoned Broccoli
Hot Biscuits

6. Assume a healthcare foodservice produces food using cook/chill technology. Describe two different methods to distribute and serve patient meals.
7. Compare and contrast a straight line cafeteria with a hollow square (scramble system) cafeteria.
8. Discuss three areas or processes that a manager could monitor/control to assure that food quality is excellent in any foodservice organization.

Figure 7: Final Examination Questions - Research Study - Fall 1995

SHORT RESPONSE FORM

HRIM AND NTD
STUDENT SURVEY

Identification _____

PLEASE GRID YOUR RESPONSES USING A NUMBER 2 PENCIL-GRID YOUR SOCIAL SECURITY NUMBER

1. Gender: Male 1 Female 2
 2. Major: HRJM 1 DIET 2 APN 3 NS 4 OTHER 5
 3. Yr. of Birth: 1940-1959 1 1960-1964 2 1965-1969 3 1970-1974 4 1975-1980 5
 4. Type of organization in which you are currently or were most recently employed:

- | | | | | |
|-------------|--------------|-------------------------------|---------------------|-------|
| Health care | Eating place | Hotel/ other lodging property | Recreation facility | Other |
| 1 | 2 | 3 | 4 | 5 |
5. Length of time with organization:
 0-6mo. 1 7-11 mo. 2 1-2 yrs. 3 3-5 yrs. 4 6 yrs. or more 5
6. Level of position:
 Top mgt. 1 Mid-mgt. 2 Supervisory 3 Salaried (non-mgt.) 4 Hourly 5
7. Hours worked per week:
 0-10 1 11-20 2 21-30 3 31-40 4 41 or more 5

For the following statements about your current or most recent job, indicate your response using the following criteria:

- | | | | | |
|--------------------------|-----------------|-----------------------------------|--------------|-----------------------|
| STRONGLY DISAGREE | DISAGREE | NEITHER AGREE NOR DISAGREE | AGREE | STRONGLY AGREE |
| 1 | 2 | 3 | 4 | 5 |

8. This position will contribute useful experience to my future career.
9. My subordinates/peers tend to possess the same organizational goals that I have.
10. Participative decision making requires divulging too much confidential information.
11. Many organizational problems disappear when everyone has a chance to participate in decision making.
12. My subordinates/peers are generally informed and experienced.
13. Participative decision making is widely used in my organization.
14. Participative decision making gives too much power to subordinates.
15. Participative decision making usually results in effective decisions.
16. I am free to make decisions as I wish in my organization.
17. Subordinates/peers often cannot be trusted.
18. Participative decision making is promoted within my organization.
19. Participative decision making promotes positive relationships at all levels of the organization.
20. My boss frequently solicits my participation in his or her decisions.
21. I plan to frequently employ participative management techniques in the future.

DO NOT MARK IN SHADED BORDER

INSTRUCTIONS

Use No. 2 pencil.
 Erase completely.
 Fill in bubble completely.

IDENTIFICATION NUMBER	0	0	0	1	1	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9
-----------------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

1	A	B	C	D	E	8	A	B	C	D	E	15	A	B	C	D	E	22	A	B	C	D	E
2	A	B	C	D	E	9	A	B	C	D	E	16	A	B	C	D	E	23	A	B	C	D	E
3	A	B	C	D	E	10	A	B	C	D	E	17	A	B	C	D	E	24	A	B	C	D	E
4	A	B	C	D	E	11	A	B	C	D	E	18	A	B	C	D	E	25	A	B	C	D	E
5	A	B	C	D	E	12	A	B	C	D	E	19	A	B	C	D	E	26	A	B	C	D	E
6	A	B	C	D	E	13	A	B	C	D	E	20	A	B	C	D	E	27	A	B	C	D	E
7	A	B	C	D	E	14	A	B	C	D	E	21	A	B	C	D	E	28	A	B	C	D	E

E	0	1	2	3	4	5	6	7	8	9
D	0	1	2	3	4	5	6	7	8	9
C	0	1	2	3	4	5	6	7	8	9
B	0	1	2	3	4	5	6	7	8	9
A	0	1	2	3	4	5	6	7	8	9

15	0	1	2	3	4	5	6	7	8	9
16	0	1	2	3	4	5	6	7	8	9
17	0	1	2	3	4	5	6	7	8	9
18	0	1	2	3	4	5	6	7	8	9
19	0	1	2	3	4	5	6	7	8	9

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Figure 8: Propensity for Participative Management - Student Version - Adapted from Parnell, et al., 1992. Reprinted with Permission

Thank you so much for taking the time to complete this questionnaire.

Code _____

SURVEY OF MANAGERS IN HOSPITALITY AND HEALTHCARE

PLEASE CIRCLE OR WRITE IN YOUR RESPONSES AS INDICATED

- | | | | |
|--------------------------------------------------------------|----------------------|-----------------------|---------------------------------|
| 1. Gender: | Male | Female | |
| 2. Type of organization in which you are currently employed: | Health Care | Eating Place | Hotel/other lodging property |
| | Recreation Facility | Other (Specify) _____ | |
| 3. Organizational structure: | Independent | Franchise | Multi-unit |
| | Contractor | Other (Specify) _____ | |
| 4. Your length of time with this organization: | _____ years | | |
| 5. Level of your position: | Owner | Top Management | Mid-level Management |
| | Supervisory | Salaried (non-mgt) | |
| 6. Average number of hours that you work per week: | _____ | | |
| 7. Your highest level of education: | High School | Some College | Associate's Degree |
| | Bachelor's Degree | Advanced Degree | |
| 8. Total years of management experience: | _____ | | |
| 9. Number of employees that you supervise: | _____ | | |
| 10. Type of employee that you supervise: | Mid level management | Supervisory staff | Salaried Staff (non-management) |
| | Hourly Employees | | |

OVER

Figure 9: Propensity for Participative Management - ADA and NRA version - Adapted from Parnell, *et al.*, 1992. Reprinted with Permission

11. Type of employee participation programs in existence in your organization (Circle all that apply):
- | | | | |
|-----------------------|----------------------------|-----------------------------------|----------------------|
| TQM/CQI/QIP | Quality circles | ESOP | Gainsharing |
| QWL | Self-pacing of work | Independent work teams | Flexible work hours |
| MBO | Problem-solving committees | Ombudsman | Attitude Surveys |
| Incentive Pay Systems | Merit Pay Systems | Employees on policy making bodies | Profit sharing plans |

PLEASE CIRCLE YOUR OPINION ABOUT THE FOLLOWING IN YOUR CURRENT POSITION

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
12. My subordinates tend to possess the same organizational goals that I have.	1	2	3	4	5
13. Participative decision making requires divulging too much confidential information.	1	2	3	4	5
14. Many organizational problems disappear when everyone has a chance to participate in decision making.	1	2	3	4	5
15. My subordinates are generally informed and experienced.	1	2	3	4	5
16. Participative decision making is widely used in my organization.	1	2	3	4	5
17. Participative decision making gives too much power to subordinates.	1	2	3	4	5
18. Participative decision making usually results in effective decisions.	1	2	3	4	5
19. I am free to make decisions as I wish in my organization.	1	2	3	4	5
20. Subordinates often cannot be trusted.	1	2	3	4	5
21. Participative decision making is promoted within my organization.	1	2	3	4	5
22. Participative decision making promotes positive relationships at all levels of the organization.	1	2	3	4	5
23. My boss frequently solicits my participation in his or her decisions.	1	2	3	4	5
24. I plan to frequently employ participative management techniques in the future.	1	2	3	4	5

employment, level of position, hours worked, and whether the student believed the position would contribute to their future career goals. Demographic information was collected from the management dietitians and restaurateurs as well.

STATISTICS USED

For both the pilot test and actual study descriptive statistics including frequencies, means, standard deviation, independent and dependent t tests plus Chi Square tests using SAS (SAS, 1985 and 1989) were conducted as appropriate to determine significant differences between the two methods of instruction and the likelihood that questions in the exams were answered randomly. Correlations were used to identify the strength of the relationship between questions on the PPM instrument of both industry and student responses (SAS, 1989). Confirmatory factor analysis using oblique rotation of the responses from hospitality and dietetics professionals was performed to establish construct validity of the PPM instrument (Parnell, *et al.*, 1992). Factor analysis of the second student survey was also performed. Stepwise linear regression was conducted to determine which independent variables (major, gender, GPA overall and in major, section, or questions about participative management) would predict the dependent variables (preferred learning environment, pre-test score, final exam grade, or likelihood of using participative management).

HYPOTHESES TO BE TESTED (Table 1)

- H_0 1: Students who experience Quantity Food Production and Service through Problem-Based Learning will achieve the same grade on a comprehensive final examination as students who experience Quantity Food Production and Service through the traditional lecture-based method
- H_A 1: Students who experience Quantity Food Production and Service through Problem-Based Learning will not achieve the same grade on a comprehensive final examination as students who experience Quantity Food Production and Service through the traditional

lecture-based method.

Many studies have found little or no difference in learning between PBL and traditional lecture method of instruction for medical students (Bridgham, Solomon and Haf, 1991; Mennin, Friedman *et al.*, 1993; Norman and Schmidt, 1992; Schmidt, Dauphinee & Patel, 1987; Tomczak, 1991; Moore, 1991). Lack of difference in learning between two methods of education may reflect on the measures used (Norman, 1988; Albanese and Mitchell, 1993). Saldo, Paper and Agnew (1994) discussed concerns that students in PBL courses are not being “taught” the same amount as lecture method students.

H₀2: Students who experience Quantity Food Production and Service through Problem-Based Learning will evaluate their progress, course description, self-rating, and methods the same as students who experience Quantity Food Production and Service through the traditional lecture-based method.

H_A2: Students who experience Quantity Food Production and Service through Problem-Based Learning will not evaluate their progress, course description, self-rating, and methods the same as students who experience Quantity Food Production and Service through the traditional lecture-based method.

Norman and Schmidt (1992) indicated that PBL increased student motivation and was more stimulating than was a conventional program for medical students. The learning environment of PBL is described as more flexible and meaningful with a better emotional climate (Schmidt, *et al.*, 1987). Many students who experienced both PBL and LB preferred PBL (Moore, 1991). Students enjoy themselves more in PBL (Norman, 1988; Albanese and Mitchell, 1993).

H₀3: Students who experience Quantity Food Production and Service through Problem-Based Learning will have the same propensity for participative management as students who experience Quantity Food Production and Service through traditional lecture-based method.

H_A3: Students who experience Quantity Food Production and Service through Problem-Based Learning will have a greater propensity for participative management than students who experience Quantity Food Production and Service through traditional lecture-based method.

Parnell, *et al.* (1992) suggested that propensity for participative management is a learned trait.

PBL encourages cooperation, teamwork, and conflict resolution (Pallie and Carr, 1987).

McGregor (1960) believed there were a number of classroom techniques which could improve problem-solving skills. Greising (1989) indicated that business schools were adding activities

such as role-playing, games, and team work drills to the curriculum. Muller *et al.* (1991)

reported the addition of leadership and group process using action and experience learning to business school programs. Hospitality students viewed an open management style on the part of supervisors as important, but did not believe this style was actually found among managers in the industry (Knutson and Patton, 1992).

Table 1: Hypotheses, Variables, and Statistical Tests

Hypothesis	Dependent variable	Independent variable	Statistical tests
<p>H₀ 1: Students who experience Quantity Food Production and Service through Problem-Based Learning will achieve the same grade on a comprehensive final examination as students who experience Quantity Food Production and Service through the traditional lecture-based method.</p>	<p>Final exam questions selected Final exam grade</p>	<p>Section Major GPA Gender Credits in the major GPA in the major</p>	<p>Independent t test Chi square Stepwise linear regression</p>
<p>H₀ 2: Students who experience Quantity Food Production and Service through Problem-Based Learning will evaluate their progress, course description, self-rating, and methods the same as students who experience Quantity Food Production and Service through the traditional lecture-based method.</p>	<p>IDEA evaluation</p>	<p>Section</p>	<p>Independent t test</p>
<p>H₀ 3: Students who experience Quantity Food Production and Service through Problem-Based Learning will have the same propensity for participative management as students who experience Quantity Food Production and Service through traditional lecture-based method.</p>	<p>PPM pretest PPM post test</p>	<p>Section Major Gender GPA</p>	<p>Independent t test Stepwise linear regression Correlation Factor analysis</p>

CHAPTER 4

RESULTS AND DISCUSSION

PILOT STUDY

DEMOGRAPHICS

There were 45 students in the lecture-based (LB) section and 36 students in the Problem-Based Learning (PBL) section (Table 2). The PBL class was restricted to the number of seats available in the PBL classroom. LB was about equally divided between dietetics majors and HRIM majors while there were two and a half times more dietetics majors than HRIM majors in the PBL classes. Women outnumbered men by about five to one in LB and four to one in the PBL class.

TABLE 2: Demographic characteristics of two sections of Quantity Food Production and Service - Fall semester 1994.

CHARACTERISTIC	LB n = 45	PBL n = 36
Major		
DIET/CP/NS/APN ^(a)	24	26
HRIM ^(b)	21	10
Gender		
Male	7	7
Female	38	29

^(a) Majors in dietetics, coordinated program in dietetics, nutritional science, applied nutrition

^(b) Majors in hotel, restaurant and institutional management

INITIAL DIFFERENCES BETWEEN THE GROUPS

PREREQUISITE KNOWLEDGE

There was no difference in knowledge of food principles and basic nutrition between

the two sections using an independent t test (Table 3). Linear regression of independent variables (major, grade point average [GPA], gender, and section) on the dependent variable (Prescore) demonstrated that twenty percent of the variance in knowledge of food and nutrition at the beginning of the course was explained by overall GPA, not section, major, or gender. A one variable model was the best fit, $F(1,38) = 9.31, p < 0.005, R^2 = 19.7\%$. The final regression equation was $\text{Prescore} = 0.146 + (3.23) \text{GPA}$. This indicates that students in both sections were not different initially in their knowledge of the prerequisite information but students with higher GPAs performed better on the pre-test.

The PBL class was encouraged to discuss the test within their groups and then retake it. This activity was used as an icebreaker to introduce the group process and to demonstrate to the PBL students that working together in groups would improve their learning beyond what each knew individually. There was a significant improvement ($p < 0.001$) in the score (12.5 to 15.0) using a dependent t test (Table 3).

TABLE 3: Pre-test of knowledge of food principles and basic nutrition (mean \pm standard deviation) - 22 items

LB n = 38	PBL - Initial n = 36	PBL - After Discussion n = 26
11.9 (2.4)	12.5 (2.6)	15.0 (2.2) ***

*** $p < 0.001$

IDEAL LEARNING ENVIRONMENT (LES)

PBL students had a significantly higher ($p < 0.01$) initial LES (2.97) than LB students (2.45) even before any class sessions occurred using an independent t test (Table 4). It is not clear why the sections differed initially in their preferred learning environment. It may be that due to a class scheduling conflict all Coordinated Program in Dietetics (CP) students were

assigned to the PBL class. These students were selected for the CP through a rigorous process and may have been more mature and focused than other students. Since the LES measures maturation of the learner, the ten CP students may have weighted the LES towards a higher score for the PBL section.

Linear regression of independent variables (major, GPA, gender, and section) on the dependent variable (LES) developed a one-variable model, $F(1,38) = 4.51, p < 0.05, R^2 = 10.6\%$. That is, eleven percent of the variance in the learning environment survey (LES) pretest was explained by the section. The final regression equation was $LES_{Pretest} = 2.45 + (0.42)$ Section. The LES post test was not different from the pre-test for either section indicating that for this course, method of instruction did not alter the preferred learning environment.

Students in the LB class however thought that the lecture method more nearly met their chosen learning environment. PBL students had a significantly ($p < 0.05$) lower agreement that the method of instruction met their chosen learning environment using an independent t test (Table 4).

The LES uses Perry's model of intellectual and ethical development. It was evident that these upper class students were at a relatively low level of intellectual and ethical development. That is they were in transition between the dualist position (Level 1) and the multiplist position (Level 3). For this student, the preference is for a teacher-centered environment with limited discussion. They preferred to view the teacher as the source of right and wrong answers and wished to learn what they needed to know in order to get good grades. This level of student has discomfort with an unstructured environment and it is uncomfortable when forced to take responsibility for his/her own learning. Many students know how to be successful in a lecture-based classroom, but they find the PBL class to be anxiety-producing.

TABLE 4: Learning environment survey - Perry position before and after instruction.

Criteria	LB	PBL
Average Perry position		
Before	2.45 ^(a)	2.97 **
After	2.48	2.83 **
Level of Agreement with chosen learning environment	3.87 ^(b)	3.0 *

** p<0.01, * p<0.05

^(a) 1 = dualist, 3 = multiplist, 5 = relativist

^(b) 1 = low, 5 = high

ATTENDANCE

There was a significant difference between the average number of sessions attended in each section using an independent t test (Table 5). LB students on average attended 17.5 of 26 sessions. The fewest lectures attended was six and the most attended was 26 but only one student attended every lecture. In the PBL class the average attendance was 23.5 sessions. The fewest sessions attended was 18 and the most attended was 26 with one sixth of the class attending every session. The pattern of student attendance between the sections was interesting, illustrated in Figure 10. For LB attendance never exceeded 80% of the class except when quizzes or exams were scheduled. For PBL attendance was never below 80%.

TABLE 5: Class sessions attended of 26 sessions offered - Fall 1994 - Comparison of lecture-based (LB) and Problem-based Learning (PBL)

	LB	PBL
Mean (\pm standard deviation)	17.5 (5.1)	23.5 (1.9) ***
Minimum	6	18
Maximum	26	26

*** p<0.001

PERCENT OF REGISTERED STUDENTS ATTENDING

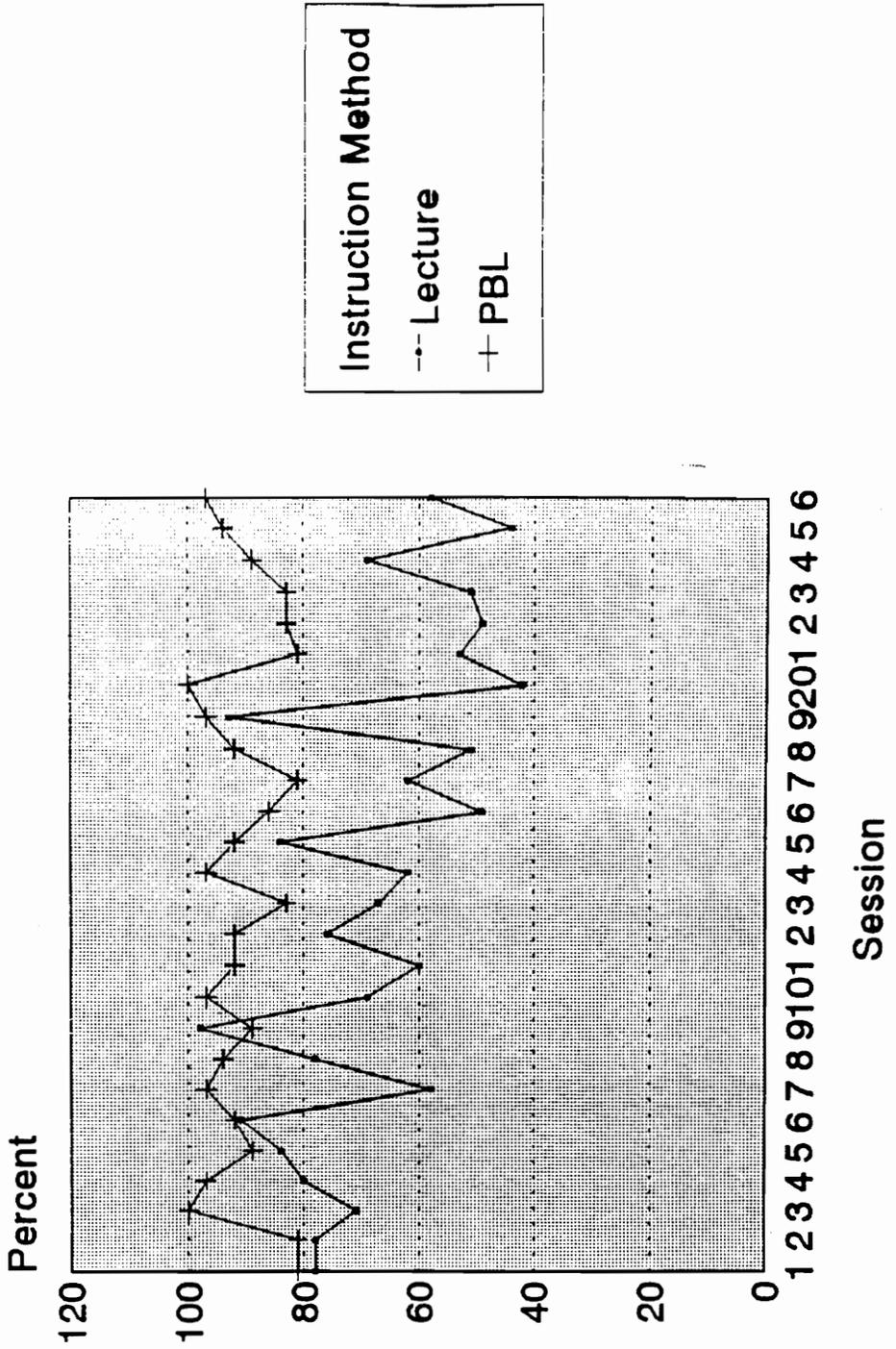


Figure 10: Attendance Profile - Percentage of Enrolled Students) - Fall 1994

FACULTY ASSESSMENT OF STUDENT KNOWLEDGE

All blue book examinations from both sections were intermingled and graded blind.

Students in each section chose to answer the final examination questions approximately equally (Table 6) although the choice of questions was not random. Question four was least frequently answered in both sections.

TABLE 6: Percentage of students who selected each final exam question to answer (Choose 3 from Questions 1-5 and 2 from Questions 6-8)

Question	LB %	PBL %
5	87	78
2	84	92
1	67	64
3	49	47
4	13	19
6	87	81
8	62	81
7	49	39

Students in both sections performed similarly in their response to the various questions (Table 7). LB students performed significantly better ($p < 0.05$) on the first question and the PBL group performed significantly better ($p < 0.05$) on questions two and seven. There were no significant differences on the other five questions. Linear regression of independent variables (major, GPA, gender, and section) developed a two-variable model as the best fit, $F(2,27) = 7.57$, $p < 0.005$, $R^2 = 29.0\%$. That is, twenty-nine percent of the variance in the final exam total score was explained by the GPA and major. The final regression equation was $\text{Final} = 28.28 + (18.56)\text{GPA} - (11.13)\text{Major}$. This result indicates that learning as measured by an essay-type examination was achieved equally by both methods of instruction.

Students with a higher GPA overall and students in the HRIM major performed better regardless of section. One of the questions available to be answered was Question 3.

Discuss the principal methods of purchasing needed goods for a foodservice organization. Include a description of some of the major variations or alternate buying arrangements. Include advantages of each method.

This question was answered by almost 50% of the students in both sections and the scores were not significantly different (7 of a possible 9 points) between sections (Table 7). Since HRIM majors take an additional course in purchasing during the same semester it is not surprising that they were able to perform well on this question and thereby have a higher grade on the final exam than dietetics majors. This may have contributed to the significance of major as a predictor of the score on the final exam.

TABLE 7: Final exam scores - Fall 1994 - mean score (\pm standard deviation)

Question	Points Possible	LB	PBL
1	9	8.4 (0.9)	7.3 (1.4)*
2	9	5.0 (1.8)	5.6 (2.1)*
3	9	6.9 (2.4)	7.1 (1.5)
4	9	5.0 (2.5)	7.2 (2.1)
5	9	5.6 (1.7)	6.1 (1.7)
6	4	2.9 (1.2)	2.9 (1.1)
7	4	1.5 (1.2)	2.5 (1.1)*
8	4	2.8 (1.3)	3.0 (0.9)

* $p < 0.05$

STUDENT ASSESSMENT OF THEIR PROGRESS

Fifty eight percent of the students in the LB section and 97% in the PBL section completed the IDEA survey (Table 8). The results of student evaluations were not analyzed statistically but there are some interesting observations to be made which reinforce information provided through more qualitative sources. Students in LB thought they learned more than the PBL class. All four parameters which comprise subject matter mastery in the IDEA instrument were above the 82nd percentile for LB with two above the 92nd percentile. (Percentiles are

only reported for this instrument when the instructor identifies the parameter as either essential or very important. The instructions with the IDEA instrument recommend that no more than five parameters be so denoted.) PBL students perceived that they learned less than LB students. Two parameters of student matter mastery measured for PBL were ≤ 60 th percentile. This perception is not supported by the results of the final exam which showed equal learning with both methods. Students reported informally that there was discussion outside of class between students in both sections comparing what they were studying. PBL students may have identified that they were covering less material than LB students so they assumed they were learning less.

PBL students perceived they developed thinking and problem solving skills (91st percentile) as compared with LB students (71st percentile). Additionally PBL students perceived greater development of effective communication skills (89th percentile), creative capacities, and sense of personal responsibility (90th percentile) which results were not perceived by students in LB. This outcome is positive because thinking, creativity, problem solving, communication skills, and a sense of responsibility are essential in the graduates of both academic programs and are important management skills.

Both sections of students provided approximately the same rating for course description parameters although PBL students perceived they worked somewhat harder than LB students and that the subject was more difficult. The rating as to whether they would like the instructor again was exactly the same (3.7 on a scale of 1-5). Important differences between the two sections were the instructor's communication of content and purpose. Students in PBL felt more involved than did LB students. Students in LB were much more satisfied with the demonstration of the significance of the subject, summarization methods, communication of course objectives, and explanations than were students in the PBL section. This reinforced comments by the PBL students that they wished they had more lecture. This evaluation also suggested that the instructor needed to build in more structure and reinforcement in

subsequent offerings of the course.

Table 8: IDEA Rating-Fall semester 1994 - Comparison of quantity food production and service taught by either lecture (LB) or Problem-Based Learning (PBL) method

Level of student motivation for both classes was Level I (Lowest level)
 LB section - 26 of 45 students (58%) completed course evaluation.
 PBL section - 35 of 36 (97%) completed course evaluation.

EVALUATION - PROGRESS RATING

SUBJECT MATTER MASTERY

	LB	%ile	PBL	%ile
Factual knowledge	4.0 @ #	93	3.3	
Principles and theories	3.7 #	82	3.4 #	55
Professional skills & viewpoints	3.7 #	88	3.5	
Discipline's methods	3.9 #	94	3.3 #	60

DEVELOPMENT OF GENERAL SKILLS

	LB	%ile	PBL	%ile
Thinking & problem solving	3.5 #	71	4.0 #	91
Creative capacities	3.3		3.8	
Effective communication	3.0		3.7 #	89

PERSONAL DEVELOPMENT

	LB	%ile	PBL	%ile
Personal responsibility	3.1		3.8 #	90
General liberal education	2.6		2.3	
Implications for self-understanding	3.1		3.3	

@ 1 = low, 5 = high

Identified by the instructor as either essential or very important

COURSE DESCRIPTION

	LB	PBL
Amount of reading	2.5 @	2.7
Amount of other work	3.2	3.6
Difficulty of subject matter	2.7	3.0
Content integration	3.9	3.4

@ 1 = Much less than most courses, 5 = Much more than most

STUDENT'S SELF RATING

	LB	PBL
Worked hard	2.8 @	3.2
Strong desire to take course	2.4	2.7
Would like instructor again	3.7	3.7
Improved attitude toward field	3.6	3.3

@ 1 = Definitely false, 5 = Definitely true

METHODS**INVOLVING STUDENTS**

	LB	PBL
Promoted teacher-student discussion	3.7 @	4.1
Helped student answer own questions	3.6	4.1
Encouraged student to express themselves	4.0	4.2
Changed approaches to meet new situations	3.4	3.4
Explained reasons for criticism	3.4	3.2
Encouraged comments even if irrelevant	4.0	3.6

COMMUNICATING CONTENT AND PURPOSE

Demonstrated the significance of the subject	4.4	3.8
Made it clear how each topic fit	4.3	3.4
Summarized in ways which aided retention	4.1	3.2
Clearly stated objectives of the course	4.5	3.5
Explained course material clearly	4.3	3.1
Related material to real life situations	4.6	4.0

CREATING ENTHUSIASM

Seemed enthusiastic about the subject matter	4.7	4.4
Spoke with expressiveness & variety	4.4	4.0
Made dry and dull presentations	(2.4)	(1.7)
Stimulated students to high intellectual effort	3.2	3.9
Introduced stimulating ideas about the subject	3.7	3.5

PREPARING EXAMINATIONS

Gave exams stressing unnecessary memorization	(2.5)	(2.6)
Gave examination questions which were unclear	(2.2)	(1.7)
Exam questions were unreasonably detailed	(2.6)	(2.2)

@ 1 = Hardly ever, 5 = Almost always

PROPENSITY FOR PARTICIPATIVE MANAGEMENT INSTRUMENT VALIDATION

Of the 500 surveys sent to members of the National Restaurant Association (NRA) and 500 surveys sent to members of the American Dietetic Association (ADA), three were returned as undeliverable, 12 were returned with regrets because the individuals were either no longer working or were not in management positions, five arrived too late for inclusion, and 339 valid surveys were returned completed (39.9%). The sample sizes of NRA and ADA respectively were 104 (20.8%) and 235 (47%). The valid sample sizes of each after deleting those surveys which contain missing data for factor analysis were NRA (n=66) and ADA (n=221).

Statistics performed on the data included descriptive statistics (frequencies plus mean and standard deviations), correlations, stepwise linear regression, and factor analysis. The sample size for the NRA group was too small to get a stable solution for factor analysis so the solution included the entire 287 valid responses of both NRA and ADA complete responses (29%). The ideal sample size for factor analysis is 100 or more according to Hair, *et al.*, 1987. These authors indicated there should be four to five observations for each variable although sometimes researchers are forced to use as few as two observations for each variable.

DEMOGRAPHICS

The NRA group (n=103) was 78% male whereas the ADA group (n=229) was 96% female (Table 9). About 87% of the NRA group worked in eating places and 86% of the ADA group were employed in health care facilities. Over 60% of both groups worked in independent operations with 22 of those reporting the "other" category working for the government either at the Federal, state, or local level. The majority of respondents had been employed in the same organization for over 11 years. Most of the restaurateurs (68%) were owners whereas most of the management dietitians (67%) were mid-level managers. Ninety four percent of restaurateurs and 76% of management dietitians reported working more than 40 hours per week. Essentially all of the dietitians and 60% of the restaurateurs held at least a bachelor's

degree and 54% of the dietitians had earned an advanced degree. Seventy seven percent of restaurateurs and 82% of management dietitians had over 11 years of total management experience. Sixty nine percent of restaurateurs and 56% of management dietitians supervised over 25 employees with more hourly employees being supervised by restaurateurs (55%) than by management dietitians (41%).

Management dietitians had many more employee participation plans where they worked than did restaurateurs. The most often reported program was total quality management, continuous quality improvement, or quality improvement program with 147 management dietitians and only 3 restaurateurs involved. Next most important programs were flexible work hours (NRA-27, ADA 31), problem-solving committees (NRA 16, ADA 49), merit pay systems (NRA-6, ADA-44), and employees on policy making bodies (NRA-9, ADA-31). From the 103 members of the NRA there were 99 reports of employee participation programs (0.96 per person). From 229 members of ADA there were 423 reports of employee participation programs (1.85 per person).

Table 9 : Frequency of response to demographic questions from ADA and NRA members

Questions		NRA	ADA
Gender	Male	80 (78%)@	9 (4%)
	Female	23 (22%)	220 (96%)
Type of organization in which you are employed?	Health care		201 (86%)
	Eating Place	90 (87%)	4 (2%)
	Hotel/other lodging	8 (8%)	
	Recreation	2 (2%)	
	Other	4 (4%)	29 (12%)
Organizational structure	Independent	80 (77%)	149 (64%)
	Franchise	10 (10%)	1 (<1%)
	Multi-unit	7 (7%)	29 (13%)
	Contractor	3 (3%)	23 (10%)
	Other	4 (4%)	30 (13%)
Your length of time with organization	0-2 years	12 (12%)	23 (10%)
	3-5 years	7 (7%)	35 (15%)
	6-10 years	20 (20%)	49 (21%)
	11-20 years	36 (36%)	72 (31%)
	≥ 21 years	27 (27%)	55 (24%)

Level of your position	Owner	71 (68%)	2 (<1%)
	Top management	26 (26%)	68 (29%)
	Mid-level management	4 (4%)	157 (67%)
	Supervisory	2 (2%)	4 (2%)
	Salaried (non-management)	1 (1%)	2 (<1%)
Average number of hours that you work per week	0 - 15	2 (2%)	
	15 - 30	1 (1%)	4 (2%)
	31 - 40	3 (3%)	52 (22%)
	41 - 50	16 (15%)	132 (57%)
	≥ 51	82 (79%)	45 (19%)
Your highest level of education	High school	12 (12%)	
	Some college	19 (18%)	1 (<1%)
	Associate's degree	11 (11%)	1 (<1%)
	Bachelor's degree	48 (46%)	105 (45%)
	Advanced degree	14 (14%)	126 (54%)
Total years of management experience	0 - 2	2 (2%)	4 (2%)
	3 - 5	8 (8%)	14 (6%)
	6 - 10	13 (13%)	25 (11%)
	11 - 20	34 (33%)	110 (47%)
	≥ 51	45 (44%)	81 (35%)
Number of employees that you supervise	0 - 5	4 (4%)	29 (13%)
	6 - 12	9 (9%)	31 (13%)
	13 - 25	20 (19%)	41 (18%)
	26 - 50	31 (30%)	49 (21%)
	≥ 51	40 (39%)	82 (35%)
Type of employee that you supervise	Mid-level management	10 (32%)	16 (24%)
	Supervisory staff	3 (10%)	13 (19%)
	Salaried staff (non-mgt)	1 (3%)	10 (15%)
	Hourly employees	17 (55%)	28 (41%)
Type of employee participation programs in existence in your organization (circle all that apply)	TQM/CQI/QIP	2	147
	Quality circles	7	7
	ESOP	3	1
	Gainsharing	2	4
	QWL		3
	Self-pacing of work	4	11
	Independent work teams	4	30
	Flexible work hours	27	31
	MBO	2	9
	Problem-solving committees	16	49
	Ombudsman	1	7
	Attitude surveys	4	33
	Incentive pay systems	4	11
	Merit pay systems	6	44
	Employees on policy making bodies	9	31
Profit sharing plans	8	5	

@ percentages not equal to 100% due to rounding

DESCRIPTIVE STATISTICS OF PPM QUESTIONS

The means with standard deviations of the responses from the entire group and the ADA and NRA members are shown in Table 10. Restaurateurs had significantly more concerns about issues in the power dimension than did management dietitians. They were more concerned about divulging confidential information ($p < 0.0001$), about giving up power to subordinates ($p < 0.0001$), and they were less likely to trust subordinates than were dietitians ($p < 0.001$). Restaurateurs also believed that participation was promoted in their organizations to a greater extent ($p < 0.001$), was more widely used in their organizations ($p < 0.0001$), and that they were freer to make decisions on their own ($p < 0.0001$) than did management dietitians. These results may be accounted for by the fact that 68% of the restaurateurs were owners of their organization. Individuals higher in organizations frequently believe there is greater participation than their employees would report if asked. Gleeson, *et al.*, (1988) indicated in their study that upper management perceived there was more employee participation than did middle management or supervisors. In addition restaurateurs were significantly less likely to use participative management in the future than were management dietitians ($p < 0.001$). Halad and Brown (1981) suggested that managers tend to be directive and not receptive to "bottom-up" philosophies. They also noted that employees who would want greater participation tended to be young and believed that management was ineffective. The corollary can be presumed that management was older and perceived themselves to be effective. Gilberg (1988) found that managers with lower incomes and fewer than five years in the organization were most likely to practice participative management. Conversely Crandall and Parnell (1994) found a positive correlation between years of management experience and propensity for participative management.

Restaurateurs seemed to be less supportive of participative management in agreement with the study by Nebel and Stearns (1979) of young, untrained, low education, short job tenure employees. In this study a task-oriented management style was thought to be most

appropriate.

Table 10: PPM survey of ADA management dietitians and members of NRA - mean (\pm standard deviation)

Questions	entire group n~337	ADA n~233	NRA n~102
12. My subordinates tend to possess the same organizational goals that I have.	3.29 (1.0) [®]	3.36 (1.0)	3.15 (0.98)
13. Participative decision making requires divulging too much confidential information.	2.02 (0.80)	1.85 (0.68)	2.41 (0.90) ^{****}
14. Many organizational problems disappear when everyone has a chance to participate in decision making.	3.66 (0.90)	3.65 (0.93)	3.67 (0.84)
15. My subordinates are generally informed and experienced.	3.67 (0.89)	3.70 (0.90)	3.62 (0.88)
16. Participative decision making is widely used in my organization.	3.18 (1.01)	3.03 (1.02)	3.53 (0.91) ^{****}
17. Participative decision making gives too much power to subordinates.	1.98 (0.79)	1.85 (0.72)	2.26 (0.87) ^{****}
18. Participative decision making usually results in effective decisions.	3.83 (0.78)	3.87 (0.75)	3.76 (0.83)
19. I am free to make decisions as I wish in my organization.	3.60(1.03)	3.34 (0.97)	4.20 (0.91) ^{****}
20. Subordinates often cannot be trusted.	2.06 (0.83)	1.96 (0.80)	2.29 (0.85) ^{***}
21. Participative decision making is promoted within my organization.	3.49 (0.95)	3.38 (0.99)	3.75 (0.83) ^{***}
22. Participative decision making promotes positive relationships at all levels of the organization.	3.92 (0.74)	3.94 (0.72)	3.86 (0.80)
23. My boss frequently solicits my participation in his or her decisions.	3.59 (1.07)	3.54 (1.08)	3.79 (0.99)
24. I plan to frequently employ participative management techniques in the future.	3.99 (0.74)	4.09 (0.67)	3.76 (0.85) ^{***}

[®]1 = strongly disagree, 5 = strongly agree

**** p < 0.0001, *** p < 0.001.

CORRELATIONS

Correlation analysis of the combined data for questions 13 through 23 was performed for the entire group (Table 11), the ADA management dietitians (Table 12), and restaurateurs from the NRA (Table 13). Pearson correlation coefficients showed strong relationships among many of the questions. Based on Parnell *et al.* (1992), positive correlations were expected among questions 12, 15, 16, 19, 21, and 23 (culture dimension); also expected were positive correlations among questions 13, 17, and 20 (power dimension); the last group of expected positive correlations was among questions 14, 18 and 22 (organization dimension). These relationships were found for the entire group, for the ADA group, and for the NRA group with the exception of the relationship between question 12 and 19 (culture) and the relationship between question 19 and 21 (culture). For the restaurateurs these relationships were negative, but not significant (Table 13). For the entire group the relationship between question 12 and 19 was not significant (Table 11), but for the ADA sample the positive relationship was significant ($p < 0.0001$) (Table 12). In all other expected relationships between questions for both the entire group and ADA the correlation coefficient was significant. For the restaurateurs there were six relationships which although positive were not significant (12:23, 14:22, 15:19, 15:23, 16:19, and 19:23). Five of these relationships relate to the culture dimension. For several the values were approaching significance but may have required more responses. The sample of NRA members was the smallest (102) and may not have had sufficient numbers to achieve statistical significance for each of the relationships. In addition, all of the questions were not answered by all of the respondents. However, these data suggest that the culture reported by NRA members less supportive of participative management than that reported by management dietitians.

Table 11: Correlations of PPM questions - Entire group (n=337)

	Q12	Q13	Q14	Q15	Q16	Q17	Q18
Q13	-0.195**						
Q14	0.060	-0.073					
Q15	0.390****	-0.134'	0.190***				
Q16	0.300****	-0.105	0.163**	0.393****			
Q17	-0.249****	0.613****	-0.207****	-0.184***	-0.186***		
Q18	0.205***	-0.241****	0.308****	0.294****	0.248****	-0.333****	
Q19	0.105	0.076	0.173**	0.151**	0.326****	-0.013	0.145**
Q20	-0.344****	0.422****	-0.116'	-0.261****	-0.189***	0.435****	-0.228****
Q21	0.237****	-0.065	0.130'	0.321****	0.658****	-0.137'	0.185***
Q22	0.276****	-0.248****	0.291****	0.224****	0.269****	-0.340****	0.402****
Q23	0.199***	-0.124'	0.162**	0.268****	0.411****	-0.114'	0.141'
	Q19	Q20	Q21	Q22			
Q20	-0.019						
Q21	0.266****	-0.166**					
Q22	0.165**	-0.333****	0.320****				
Q23	0.236****	-0.095	0.501****	0.290****			

**** p < 0.0001, *** p < 0.001, ** p < 0.01, * p < 0.05

Table 12: Correlations of PPM questions - ADA management dietitians (n=233)

	Q12	Q13	Q14	Q15	Q16	Q17	Q18
Q13	-0.203**						
Q14	0.128	-0.082					
Q15	0.449****	-0.137'	0.198**				
Q16	0.334****	-0.121	0.129'	0.349****			
Q17	-0.248****	0.542****	-0.210**	-0.147'	-0.145'		
Q18	0.235***	-0.242***	0.349****	0.210**	0.224***	-0.291****	
Q19	0.254****	-0.107	0.193**	0.231***	0.336****	-0.176**	0.270****
Q20	-0.393****	0.428****	-0.123	-0.208**	-0.163'	0.420****	-0.169'
Q21	0.257****	-0.055	0.129	0.352****	0.684****	-0.085	0.114
Q22	0.290****	-0.192**	0.353****	0.150'	0.226***	-0.292****	0.361****
Q23	0.223***	-0.165'	0.200**	0.315****	0.438****	-0.098	0.121
	Q19	Q20	Q21	Q22			
Q20	-0.189'						
Q21	0.302****	-0.200**					
Q22	0.248***	-0.321****	0.246***				
Q23	0.219***	-0.149'	0.496****	0.242***			

**** p < 0.0001, *** p < 0.001, ** p < 0.01, * p < 0.05

Table 13: Correlations of PPM questions - NRA members (n~102)

	Q12	Q13	Q14	Q15	Q16	Q17	Q18
Q13	-0.125						
Q14	-0.121	-0.078					
Q15	0.250'	-0.111	0.175				
Q16	0.332***	-0.339***	0.263**	0.589****			
Q17	-0.210'	0.642****	-0.232'	-0.243'	-0.493****		
Q18	0.129	-0.220'	0.224'	0.469****	0.385****	-0.393****	
Q19	-0.075	0.032	0.165	0.058	0.067	-0.017	-0.001
Q20	-0.207'	0.330***	-0.111	-0.364***	-0.433****	0.390****	-0.318***
Q21	0.265**	-0.293**	0.128	0.283**	0.552****	-0.428****	0.416****
Q22	0.241'	-0.333***	0.160	0.358***	0.425****	-0.420****	0.475****
Q23	0.202	-0.180	0.025	0.131	0.256'	-0.307'	0.236
	Q19	Q20	Q21	Q22			
Q20	0.077						
Q21	-0.015	-0.213'					
Q22	0.091	-0.345***	0.561****				
Q23	0.212	0.003	0.492****	0.496****			

**** p < 0.0001, *** p > 0.001, ** p < 0.01, * p < 0.05

FACTOR ANALYSIS

Confirmatory factor analysis was conducted on the 12 questions of the PPM instrument (Q13-Q23) which are considered independent variables (Parnell, *et al.*, 1992). The SAS program was used which provided for oblique rotation. Oblique factor solutions are reported to have greater flexibility than orthogonal solutions (Hair, *et al.*, 1987) because there is no assumption that underlying dimensions are unrelated to one another as is the case with orthogonal solutions. Three factors were selected using *a priori* criterion (Hair, *et al.*, 1987). This criterion was chosen to replicate the factors which had been identified in the Parnell, *et al.* (1992) study. If, instead, the latent root criterion had been employed only two factors might have been formed because the preliminary eigenvalues of factors 1, 2, and 3 respectively were 5.2458, 2.2413, and 0.6321. The eigenvalue approach is thought to be most reliable when variables number between 20 and 50 (Hair, *et al.*, 1987). These authors indicated that with variable numbers less than 20 the number of factors extracted is likely to be conservative. Therefore there was support for specifying three factors both on the basis of *a priori* criterion and on latent root criterion. Factor loadings of $\pm .30$ are considered significant, $\pm .40$ are more important, and $\pm .50$ are highly significant according to one method of interpreting the results (Hair, *et al.*, 1987).

The questions from the PPM instrument loaded for management dietitians and restaurateurs on the same factors as did the sample in the original article (Parnell, *et al.*, 1992) although not in the same order (Table 14). Factor 1 (Organizational Culture), Factor 2 (Organizational Effectiveness) and Factor 3 (Power) in the Parnell *et al.* (1992) study were altered in the current study. Dietitians and restaurateurs responses formed Factor 1 (Organizational Culture), Factor 2 (Power), and Factor 3 (Organizational Effectiveness). Since factors are formed and ordered from those which contribute most to predicting the dependent variable to those with lessor contributions, it appeared that this population of dietitians and restaurateurs believed that power was a more potent contributor to propensity to practice

participative management methods than did the population of 220 managers of several firms in the Southern United States reported by Parnell *et al.* (1992). That population was 66% male with an average age of 31 and was distributed among all managerial levels.

The population of 287 dietitians and restaurateurs was predominately female (73% of the entire group), came from all management levels, and had many years experience in management. It has already been shown that there was a difference between NRA and ADA members in their perceptions about the power dimension and in the extent to which participative management was practiced in their organizations.

According to Parnell, *et al.* (1992), questions 12, 15, 16, 19, 21 and 23 assessed the influence of norms and behaviors at the organizational level. Questions 12 and 15 assessed the department subculture about beliefs concerning the values and attitudes and the superior/subordinate relationship. Questions 16, 19, 21, and 23 looked at the culture at the organizational level including managerial prerogatives, practices and expectations. Questions 13, 17, and 20 explored the relationship between participative decision making and the superior's power and control. Question 13 looked at the dissemination of confidential information, question 17 at the transfer of power, and question 20 at the degree of trust between manager and subordinate. Questions 14 and 18 explored beliefs about the relationship between participative decision making and decision quality and question 22 looked at interpersonal relationships.

Table 14: Factor loadings of the 12 item Propensity for Participative Management scale - All respondents from a sample of National Restaurant Association members and American Dietetics Association members. (n = 287)

Item #	Question	Fac-1 Culture	Fac-2 Power	Fac-3 Organiz
Culture subscale				
12	My subordinates tend to possess the same organizational goals that I have.	.30	-.28	.10
15	My subordinates are generally informed and experienced	.38	-.12	.14
16.	Participative decision making is widely used in my organization.	.77	-.07	-.04
19.	I am free to make decisions as I wish in my organization.	.38	.14	.19
21.	Participative decision making is promoted within my organization.	.88	.04	-.09
23.	My boss frequently solicits my participation in his or her decisions.	.56	.01	.05
Power subscale				
13.	Participative decision making requires divulging too much confidential information.	.06	.86	.12
17.	Participative decision making gives too much power to subordinates.	.08	.77	-.12
20.	Subordinates often cannot be trusted.	-.11	.58	-.01
Organization subscale				
14.	Many organizational problems disappear when everyone has a chance to participate in decision making.	-.03	.09	.60
18.	Participative decision making usually results in effective decisions.	.06	-.12	.53
22.	Participative decision making promotes positive relationships at all levels of the organization.	.18	-.15	.46

STEPWISE LINEAR REGRESSION

An analysis of the independent variables (questions 12 through 23) on the dependent variable (question 24, "I plan to frequently employ participative management techniques in the future") was conducted. Stepwise linear regression using the forward selection procedure (SAS, 1989) was continued through nine steps for the data for the entire sample, both NRA and ADA responses. The addition of questions occurred until no other variable met the 0.5000 significance level for entry into the model. The steps and the variables entered are listed in Table 15.

Table 15: Stepwise linear regression of intent to practice participative management by ADA and NRA members. (n = 283)

Step	Question
1	22. Participative decision making promotes positive relationships at all levels of management
2	17. Participative decision making gives too much power to subordinates.
3	21. Participative decision making is promoted within my organization
4	18. Participative decision making usually results in effective decisions
5	12. My subordinates tend to possess the same organizational goals that I have
6	14. Many organizational problems disappear when everyone has a chance to participate in decision making
7	13. Participative decision making requires divulging too much confidential information
8	23. My boss frequently solicits my participation in his or her decisions
9	15. My subordinates are generally informed and experienced

The best solution occurred at step 7, $E(7,276) = 29.35$, $R^2 = 42.67\%$, $p < 0.0001$ and included questions 12, 13, 14, 17, 18, 21, and 22, all with a significance $p < 0.05$. That is

43% of the variance in intent to use participative management techniques in the future could be explained by seven of the 12 questions. When additional questions were added to the equation the statistical significance of the additions was greater than $p=0.05$. The final equation was: Intent to practice participative management in the future = $2.07 + (0.119)Q12 - (0.126)Q13 + (0.096)Q14 - (0.117)Q17 + (0.168)Q18 + (0.144)Q21 + (0.141)Q22$. Both questions 13 and 17 are negatively related to the dependent variable because they are reversed scored in the instrument. Of the six questions in the culture factor, only 2 (12 and 21) were included in the final regression along with two from the power dimension (13 and 17) and all three questions from the organizational dimension (14, 18, and 22). Three questions for which there was a significant difference between NRA and ADA members (Table 10) entered into the final equation (Q 13, 17, and 21). But three questions for which there was a significant difference between restaurateurs and dietitians were not in the final solution (Q 16, 19, 20).

Stepwise linear regression was also conducted on the ADA group (Table 16) and the NRA group (Table 17).

Table 16: Stepwise linear regression of intent to practice participative management techniques by ADA management dietitians. (n = 218)

Step	Question
1	19. I am free to make decisions as I wish in my organization.
2	22. Participative decision making promotes positive relationships at all levels of the organization.
3	12. My subordinates tend to possess the same organizational goals that I have.
4	17. Participative decision making gives too much power to subordinates.
5	23. My boss frequently solicits my participation in his or her decisions.
6	14. Many organizational problems disappear when everyone has a chance to participate in decision making.
7	21. Participative decision making is promoted within my organization.
8	18. Participative decision making usually results in effective decisions.
9	20. Subordinates often cannot be trusted.
10	15. My subordinates are generally informed and experienced.

Ten steps were conducted on the ADA data until no other variable met the 0.5000 significance level for entry into the model. The best solution for the regression occurred at step 6. At step 7 the Prob>F value for the variable to be entered was 0.0972 which did not meet the significance criteria of Prob>F 0.05. Step 6 provided an $F(6,212) = 20.11$, $R^2 = 36.28\%$, $p < 0.0001$, and included questions 12, 14, 17, 19, 22, and 23. The final equation was: Intent to practice participative management techniques = $2.375 + (0.105)Q12 - (0.090)Q14 - (0.151)Q17 + (0.157)Q19 + (0.121)Q22 + (0.095)Q23$. Therefore 36% of the variance in intent to practice participative management in the future by this sample of management dietitians could be explained by six questions. For this group three questions from the culture dimension (12, 19, and 23), two questions from the organizational dimension (14 and 22), and

one question from the power dimension (17) were important to intent to practice participative management for management dietitians. Two questions which were significantly different between ADA and NRA members (Table 10) entered the final equation (Q17 and 19).

Table 17: Stepwise linear regression of intent to practice participative management techniques by NRA members. (n = 63)

Step	Question
1	18. Participative decision making usually results in effective decisions.
2	21. Participative decision making is promoted within my organization.
3	14. Many organizational problems disappear when everyone has a chance to participate in decision making.
4	12. My subordinates tend to possess the same organizational goals that I have.
5	13. Participative decision making requires divulging too much confidential information.
6	19. I am free to make decisions as I wish in my organization.
7	23. My boss frequently solicits my participation in his or her decisions.

The stepwise linear regression of the NRA data was continued to step 7 after which no other variable met the 0.5000 significance level for entry into the model. The decision was made to use the solution generated at step 5 in spite of the fact that the last variable entered (Q 13) had a Prob>F of 0.073, approaching significance. Only 63 of the 104 NRA members who returned the survey answered all of the questions so the number is smaller than desired. All of the other variables entered the equation with $p < 0.05$. This solution had $F_{(5,58)} = 22.34$, $R^2 = 65.82\%$, $p < 0.0001$. The final equation was: Intent to practice participative management = $0.065 + (0.173)Q12 - (0.144)Q13 + (0.229)Q14 + (0.440)Q18 + (0.278)Q21$. Therefore 66% of the variance in intent to practice participative management techniques in the future could be explained by five questions for the sample of NRA managers. For this group two

questions from the culture dimension (12 and 21), two questions from the organization dimension (14 and 18), and one question from the power dimension (13) were important predictors of intent to practice participative management. Two questions which were significantly different between NRA and ADA members (Table 10) entered this equation (Q 13 and 21).

Only questions 12 and 14 appeared in the regression equations for both restaurateurs and management dietitians. Two questions about which the restaurateurs and dietitians disagreed (Q16 and 20) entered into none of the regression solutions.

RESEARCH STUDY

DEMOGRAPHICS

Eighty percent of the PBL section and 85% of the LB section were female (Table 18). Less than one fourth of LB and 37% of the PBL class were HRIM majors. The students in LB were somewhat older than those in the PBL section. Sixty six percent of LB students were born between 1970 and 1974 (21-25 years old), whereas 50% of the PBL students were born between 1975 and 1980 (15 - 20 years old).

Forty percent of LB students were employed in eating places as were one third of PBL students. About one fourth of all of the students were employed in jobs other than health care or traditional hospitality positions. More than half of both groups had been in their current position for less than a year and over 75% were hourly employees. Before the class began about one third of each group worked between 31 and 40 hours per week. By the end of class, hours worked per week had dropped to a mode of 11 to 20 hours per week probably reflecting a difference in summer time employment and employment time during the academic year. Over half of each group believed that the job they held would contribute useful experience to their future career.

TABLE 18: Demographic characteristics of students: Pre and post surveys of LB and PBL sections - Fall 1995

Questions	Variables	LB				PBL			
		Before		After		Before		After	
		N	%	N	%	N	%	N	%
1. Gender	Male			8	14.5			7	20
	Female			46	83.6			28	80
2. Major	HRIM#			12	21.8			13	37.1
	DIET\$			24	43.6			14	40
	APN\$			12	21.8			7	20
	NS\$			6	10.9				
	Other			1	1.8			1	2.9
3. Year of birth	1940-59								
	1960-64			2	3.6			1	2.9
	1965-69							3	8.6
	1970-74			36	65.5			15	42.9
	1975-80			17	30.9			16	45.7
4. Type of organization in which you are currently or were most recently employed.	Healthcare			9	16.4			6	17.1
	Eating place			20	36.4			10	28.6
	Hotel			5	9.1			6	17.1
	Recreation			5	9.1			1	2.9
	Other			16	29.1			11	31.4
5. Length of time with organization.	0-6 months			25	45.5			18	51.4
	7-11 months			6	10.9			4	11.4
	1-2 years			11	20			8	22.9
	3-5 years			9	16.4			4	11.4
	≥ 6 years			4	7.3			1	2.9
6. Level of position	Top mgt.								
	Mid mgt.			1	1.8				
	Supervisory			5	9.1			1	2.9
	Salaried			5	9.1			3	8.6
	Hourly			44	80			31	88.6
7. Hours worked per week	0-10	4	7.4	7	12.7	1	2.9	6	17.1
	11-20	11	20.4	17	30.9	8	22.9	15	42.9
	21-30	16	29.6	15	27.3	10	28.6	4	11.4
	31-40	17	31.5	10	18.2	13	37.1	9	25.7
	≥41	6	11.1	5	9.1	3	8.6	1	2.9
8. This position will contribute useful experience to my future career.	SD [®]			1	1.8			4	11.4
	D			2	3.6			3	8.6
	N			11	20			5	14.3
	A			25	45.5			11	31.4
	SA			16	9.1			12	34.3

= Hotel, Restaurant & Institutional Management, \$ = Dietetics, Applied Nutrition, Nutrition Science
[®]SD = strongly disagree, SA = strongly agree

In the LB class 46 of 55 students (84%) gave permission for their grades to be retrieved and analyzed. In the PBL class 22 of 35 students (65%) gave permission (Table 19). There was a significant difference in overall GPA ($p < 0.05$) but not in GPA in the major or number of credits taken in the major. LB students had significantly higher GPAs than did PBL students.

Table 19: Comparison of grade point average, grade point average in major, and number of credits taken in the major - Fall 1995 - mean (\pm standard deviation)

	LB (n=46)	PBL (n=22)
GPA (overall)	2.91 (0.5)	2.63 (0.55) *
GPA (major)	3.38 (0.53)	3.08 (0.71)
Number of credits in major	9.67 (7.5)	7.45 (5.39)

* $p < 0.05$

KNOWLEDGE PRETEST

The pretest of knowledge of food and nutrition principles was not different for the students in the LB and PBL sections (Table 20). The mean of LB was 12.8 correct of 22 questions and of the PBL group was 12.6. Independent t tests demonstrated that the students were not different in their prerequisite knowledge.

Table 20: Pretest of student knowledge of nutrition and food principles (22 items). Comparison of lecture-based and Problem-Based Learning section. Fall 1995

	LB n=50	PBL n=32
Mean (\pm standard deviation)	12.8 (2.9)	12.6 (2.8)
Percent correctly answered	58.4% \pm 13.0%	57.4% \pm 12.8%

no significant difference

PBL students were asked to discuss the pretest in their groups for about 15 minutes and then the pretest was readministered. The average score on the second administration (15.9) was significantly higher ($p < 0.0001$) using a dependent t test (Table 21).

Table 21: Comparison of scores on pretest before and after discussion in the PBL class. Fall 1995

	Before discussion	After discussion
Mean (\pm standard deviation)	12.6 (2.8)	15.9 (2.3) ****

**** $p < 0.0001$

When linear regression was performed to determine the variables which affected performance in the pretest (section, major, GPA, length of time with the organization, and hours worked per week) only GPA was significant. $F(5,56) = 1.417$, $R^2 = 11.23\%$, $p < 0.05$. The final equation was $\text{Pretest} = 3.577 + (2.2256)\text{GPA}$. Knowledge of food and nutrition principles therefore was the same for both sections, all majors, and both the length of time the student had worked and the hours worked per week. Only GPA was useful to predict how students would perform on a knowledge pretest.

ATTENDANCE

PBL students demonstrated better attendance than did LB students (Table 22), possibly because there was an indication in the PBL syllabus that attendance was required and because many of the PBL groups adopted attendance as one of the group rules. Attendance improved from the pilot study for LB students and worsened for PBL students, as illustrated in figure 11, compared with the pilot study as illustrated in figure 10. There were 28 possible classes for LB students to attend. The average attendance for each student was 23 classes with six students who attended every class. The total of possible classes for PBL was 40 and the average attendance for each student was 37 with seven students attending every class.

Table 22: Attendance in class during Fall semester 1995 for lecture-based and Problem-Based Learning sections.

Attendance	LB	PBL
Total possible classes	28	40
Average (\pm Standard deviation)	23 (3.5)	37 (2.1)
Minimum	12	33
Maximum	28	40

ATTENDANCE (% OF REGISTERED STUDENTS)

FALL 1995

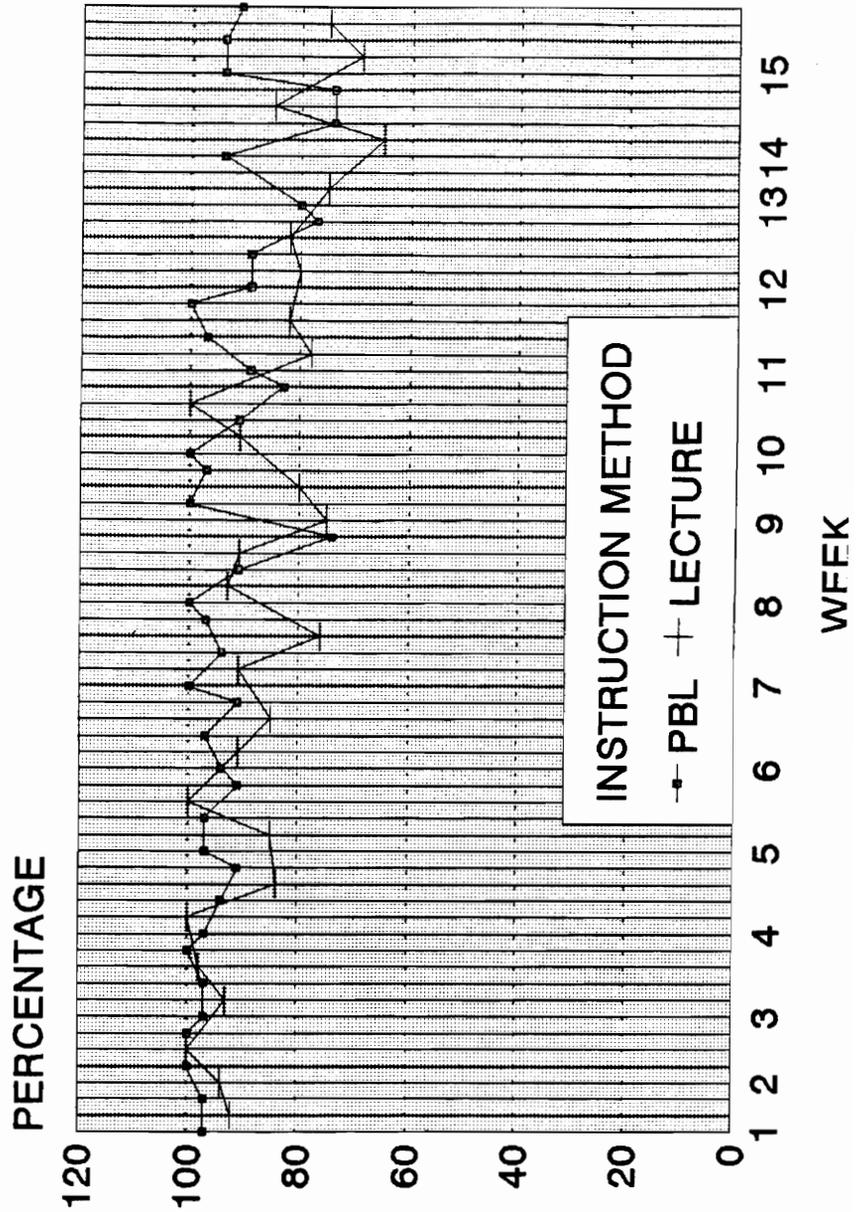


Figure 11: Attendance Profile (Percentage of enrolled students) - Fall 1995

STUDENT LEARNING AS ASSESSED BY FINAL EXAMINATION

VALIDATION OF GRADING PROCESS

Ninety students from both sections completed the final examination. All exams were graded by the instructor blind, that is the names of the students were hidden until after the grading was completed. In addition, a faculty colleague graded 20 randomly selected tests, also blind (Table 23). This process was used to provide an independent review of the grading process. Although the scores were not identical, in all but six of the twenty, the total scores were within two points. For students numbered 001, 009, and 059 there was a three point difference, for students 007 and 057 there was a four point difference, and for student 060 there was a five point difference between the scores from the two faculty. In all cases the instructor's scores were used in subsequent calculations. Four questions caused the greatest disparity between the scores of the two faculty members, a difference of greater than two points. There was one observation with large variation for both questions two and seven, and two each for questions three and eight. These disparities occurred primarily in grades of PBL students (006, 003, 013, and 007). Only one occurred with the exam of a LB student (060). There is no explanation for this variation other than subjective difference between the two instructors in interpreting student responses. Twelve students achieved higher grades with the instructor than the comparator. Four students would have gotten a higher grade from the comparator, and four students would not have seen a difference in their exam grade regardless of grader.

Table 23 : Comparison of independent faculty grading results for final examination - Students answered five of eight questions

Grader	ID #	1	2	3	4	5	6	7	8	total
a@	006	2	2	4				5	4	17
b		3	5	0				5	4	17
a	005	6	5	5				6	6	28
b		5	5	5				6	6	27
a	013	6	4	4				5	2	21
b		6	4	2				5	5	22
a	010	6	5			4		5	4	24
b		6	5			4		5	4	24
a	008	4	6	3			2		3	18
b		5	6	3			1		4	19
a	011	3	4	3		4		5		19
b		5	5	2		4		6		22
a	003	3	6	4		4		6		23
b		5	6	0		4		6		21
a	007		4	3			4	6	6	23
b			5	2			4	5	3	19
a	009	6	5	3	6		0			20
b		5	4	2	6		0			17
a	001	6	3	5	6	4				24
b		5	4	5	6	4				24
a	060	5				5.5	5	6	6	27.5
b		5.5				5	2	6	4	22.5
a	056		6		3	4		6	4	23
b			4		2	5		6	4	21
a	058	5.5	4			4.5		6	3	23
b		5	5			5		5	5	25
a	054	5		3	2			6	5	21
b		3		2	4			6	4	19
a	059			4	0		0	5	4	13
b				2	0		0	3	5	10
a	057	6	5	5		4			4	24
b		5	3	3		4			5	20
a	055		5.5		5	6	5		6	27.5
b			6		5	4	4		6	25
a	053	4	4			4	4	5		21
b		5	5			3	4	3		20
a	061		4	4	2		4	6		20
b			5	3	1		5	6		20
a	062	5.5	4	3		4	4			20.5
b		5	5	2		5	2			19
total disparity		14.5	15.5	20	4	6	8	6	14	

@ a = instructor, b = comparator

COMPARISON OF FINAL EXAMINATION RESULTS

Students were able to choose to answer five of eight questions on the final exam. A Chi Square analysis revealed that the frequency of answering the questions was not random (Table 24). Questions 1, 5, and 6 were answered by less than 50% of LB students. Questions 4, 5, and 7 were answered by less than 50% of PBL students.

There was no difference between the two sections total scores on the final examination. The only question for which there was a difference in score between the sections was number 3. This question was answered by 86% of each section with LB students performing significantly better ($p < 0.05$). It may be possible that the PBL students did not learn as much about considerations for menu development as LB students or that this question was graded differently by the faculty member. There is some evidence that the greatest grading discrepancy between the faculty graders occurred on this question, a 20 point disparity between the graders as compared with the next highest disparity of 15.5 on question 2 (Table 23).

Table 24: Final Examination - frequency of question selection and mean scores (\pm standard deviation). (Students chose 5 of 8 questions. Each question was worth 6 points.)

Questions	LB		PBL	
	number (n=55)	Mean score (\pm SD)	number (n=35)	Mean score (\pm SD)
1. Compare and contrast any two of the four production subsystems. Describe each thoroughly including information about raw ingredients, production, when and how completed product is held/stored, and comparisons of food cost, labor cost, and equipment cost.	24 ^(a) (44%)	5.2 (1.3)	28 ^(b) (80%)	5.1 (1.2)
2. Completely describe <u>one</u> microorganism capable of causing food borne illness. Discuss the types of foods likely to become contaminated, how the food becomes contaminated, and what symptoms are likely to be experienced.	47 (86%)	5.1 (0.8)	34 (97%)	4.8 (1.0)
3. Describe the information which would be important to consider when planning a menu for a non-commercial foodservice organization.	47 (86%)	4.7 (1.3)	30 (86%)	4.0 (1.2) *
4. Describe <u>three</u> tools which are available to a foodservice manager to control food production.	30 (55%)	4.5 (1.6)	9 (26%)	4.7 (0.9)
5. Develop a list of major equipment needed to produce the following menu for an industrial cafeteria which serves around 1000 meals at lunch. Assume all products are made from relatively unprocessed food ingredients, not convenience foods. List each menu item and <u>all</u> of the most appropriate major pieces of equipment beside it.	25 (46%)	4.4 (0.9)	12 (34%)	4.3 (0.9)
6. Assume a health care foodservice produces food using cook/chill technology. Describe <u>two</u> different methods to distribute and serve patient meals.	22 (40%)	3.6 (2.1)	18 (51%)	2.9 (2.0)
7. Compare and contrast a straight line cafeteria with a hollow square (scramble system) cafeteria.	40 (73%)	5.4 (1.1)	25 (35%)	5.0 (1.0)
8. Discuss <u>three</u> areas or processes that a manager could monitor/control to assure that food quality is excellent in any foodservice organization.	41 (75%)	4.4 (1.3)	19 (55%)	4.3 (1.3)

^(a) $\chi^2 = 14.0$ therefore the frequency of selection of the questions is not random.

^(b) $\chi^2 = 14.0$ therefore the frequency of selection of the questions is not random.

* $p < 0.05$

Linear regression of the independent variables (GPA, GPA in major, number of credits in the major, and section) on the dependent variable (final exam total score) found that only GPA explained the final exam total score. Twenty nine per cent of the variance in the final exam score could be explained by GPA. A one variable model was the best fit, $E(3,63) = 8.470$, $R^2 = 28.74\%$, $p < 0.0001$. The final regression equation was: Total final exam score = $10.57 + (4.81)GPA$. It may be that students with higher GPAs had learned test taking strategies which allowed them to perform better than students with lower GPAs, but the method of instruction had no effect on total final exam score.

Therefore, hypothesis 1: Students who experience Quantity Food Production and Service through Problem-Based Learning will achieve the same grade on a comprehensive final examination as students who experience Quantity Food Production and Service through the traditional lecture-based method is accepted. There is no difference in learning achieved which can be attributed to method of instruction. Using PBL instruction does not reduce or increase students' learning in the short run, and there is considerable evidence in the literature which suggests that long term recall of the information is enhanced when students use the information in context rather than as isolated nuggets of knowledge

STUDENT EVALUATIONS OF THE COURSE USING THE IDEA INSTRUMENT

Student evaluations were compared between sections (Table 25) and with the ratings from the pilot test (Table 8). Not all of the students responded to the survey. For LB students only 71% completed the instrument whereas 94% of PBL students submitted the survey. It may be that LB students who were less satisfied with the course did not turn in the instrument because they were absent on the day of administration which may have caused the LB responses to be more positive than they would have been had a larger percentage of students responded.

For many of the questions there was no significant difference between sections using independent t tests. LB students believed they had achieved more factual knowledge

($p < 0.05$), that they developed the skills, competencies, and viewpoints needed by professionals in their field better ($p < 0.05$), and that the instructor did a better job of communication the content and purpose of the course in five of six parameters measured [demonstrating the significance of the subject ($p < 0.001$), making it clear how each topic fit ($p < 0.001$), stating the course objective ($p < 0.05$), explaining course material ($p < 0.01$), and relating the material to real life situations ($p < 0.001$)]. LB students perceived the instructor to be better at introducing stimulating ideas about the subject ($p < 0.05$). PBL students perceived that there was more reading ($p < 0.01$), more other work ($p < 0.0001$), and that they worked harder ($p < 0.0001$) than did LB students. PBL students were less satisfied with exams ($p < 0.01$). But the PBL students also thought they developed effective communication skills to a greater extent ($p < 0.0001$). In addition they felt PBL was better in three parameters of involving students [student-teacher discussion ($p < 0.001$), helping students answer their own questions ($p < 0.0001$), and helping students to express themselves ($p < 0.05$)]. PBL students also felt they were more stimulated to high intellectual effort ($p < 0.01$).

The perception by PBL students of less subject matter mastery may, in fact, be viewed much more positively than the numbers suggest. PBL has as a basic premise that around any problem there are many questions (or learning issues) to be addressed and one may leave a problem with issues still unresolved. PBL helps students to identify what they do not know and provides them with a way to learn. In LB courses there may be an erroneous presumption on the part of the student that everything (s)he needed to know was made available and that there is a finite amount of knowledge to be learned in each topic. A student may leave a LB course not knowing how much more there is to learn whereas a PBL student may leave a class knowing that there are still more questions to be asked and answered. Thus the PBL student would be better prepared to be a life-long learner than the LB student.

PBL has as great advantages the ability to involve students in discussion, in answering their own questions and stimulating students to high intellectual effort. PBL students also

increased their communication skills more than did LB students.

Attempts to improve the PBL course since the first offering appeared to have succeeded in several areas although still not to the level of the LB course. Those items which were 0.3 different from the pilot test are noted. PBL students perceived a good improvement in "factual knowledge", "made it clear how each topic fit", "summarized in ways which aided retention", and "explained course material clearly." The increase in amount of material on each test was reflected in a less positive attitude on the part of students about examinations in the PBL section. Also the PBL students correctly perceived that they had more work to do with the addition of worksheets on each chapter.

Table 25: IDEA Rating - Fall semester, 1995. Comparison of Quantity Food Production and Service taught by either lecture-based method (LB) or Problem-Based Learning (PBL) - mean (\pm standard deviation)

Level of student motivation for both classes was Level I (Lowest level)
 LB section - 39 of 55 students (71%) completed course evaluation.
 PBL section - 33 of 35 (94%) completed course evaluation.

EVALUATION - PROGRESS RATING

SUBJECT MATTER MASTERY

	LB	%ile	PBL	%ile
Factual knowledge	3.9(0.66)@#	89	3.5(1.09)# *	68
Principles and theories	3.6(1.02) #	68	3.4(1.01)#	45
Professional skills & viewpoints	3.9(0.81) #	95	3.6(1.12)# *	83
Discipline's methods	3.7(1.15) #	87	3.4(1.31) #	67

DEVELOPMENT OF GENERAL SKILLS

Thinking & problem solving	3.9(0.98)#	93	3.8(1.18)#	80
Creative capacities	3.2(1.2)		3.4(1.13)	
Effective communication	2.6(1.12)		3.8(1.25) ****	

PERSONAL DEVELOPMENT

Personal responsibility	3.3(1.09)		3.8(1.24)	
General liberal education	2.4(1.31)		2.3(1.49)	
Implications for self-understanding	2.8(1.09)		3.2(1.27)	

@ 1 = low, 5 = high, ****p < 0.0001, * p < 0.05

Identified by the instructor as either essential or very important

COURSE DESCRIPTION

	LB	PBL
Amount of reading	2.5(0.82) @	3.0(0.81)**
Amount of other work	3.1(0.77)	4.2(0.71)****
Difficulty of subject matter	2.8(0.67)	3.0(0.43)
Content integration	3.9(0.77)	3.7(0.63)

@ 1 = Much less than most courses, 5 = Much more than most, **** p < 0.0001, ** p < 0.01

STUDENT'S SELF RATING

	LB	PBL
Worked hard	2.7(0.86) @	3.9(0.79)****
Strong desire to take course	2.6(1.02)	2.8(1.04)
Would like instructor again	3.9(1.28)	3.6(0.93)
Improved attitude toward field	3.7(1.10)	3.5(0.83)

@ 1 = Definitely false, 5 = Definitely true, **** p < 0.0001

METHODS**INVOLVING STUDENTS**

	LB	PBL
Promoted teacher-student discussion	3.5(0.94) @	4.3(0.85)***
Helped student answer own questions	3.3(0.81)	4.3(0.94)****
Encouraged student to express themselves	3.9(0.89)	4.4(0.86)*
Changed approaches to meet new situations	3.5(1.0)	3.7(1.17)
Explained reasons for criticism	2.6(1.55)	3.2(1.12)
Encourage comments even if irrelevant	4.1(0.94)	3.8(0.94)

COMMUNICATING CONTENT AND PURPOSE

Demonstrated the significance of the subject	4.6(0.59)	3.9(1.01)***
Made it clear how each topic fit	4.6(0.55)	3.9(0.95)***
Summarized in ways which aided retention	4.1(0.98)	3.7(0.96)
Clearly stated objectives of the course	4.3(1.10)	3.7(0.98)*
Explained course material clearly	4.3(0.77)	3.7(1.01)**
Related material to real life situations	4.7(0.46)	3.8(1.21)***

CREATING ENTHUSIASM

Seemed enthusiastic about the subject matter	4.8(0.39)	4.5(0.75)
Spoke with expressiveness & variety	4.4(0.75)	4.0(0.97)
Made dry and dull presentations	(2.3)(0.97)	(2.2)(0.97)
Stimulated students to high intellectual effort	2.9(1.18)	3.6(0.90)**
Introduced stimulating ideas about the subject	3.9(0.68)	3.4(1.00)*

PREPARING EXAMINATIONS

Gave exams stressing unnecessary memorization	(2.2)(1.23)	(3.0)(1.33)**
Gave examination questions which were unclear	(1.6)(0.90)	(2.1)(1.13)
Exam questions were unreasonably detailed	(1.9)(1.09)	(2.7)(1.07)**

@ 1 = Hardly ever, 5 = Almost always

**** p < 0.0001, *** p < 0.001, ** p < 0.01, * p < 0.05

One of the most important components of PBL is less reliance on the instructor to be the primary source of knowledge with greater involvement of the individual and the group to search out and share good sources of information. This does require more work on the part of students and is not always viewed positively by students who have achieved a level of comfort with a passive role in the classroom. PBL does prepare students well for their role as continuous learners after they leave the university. This assumption was not assessed in this research study.

Therefore Hypothesis 2: Students who experience Quantity Food Production and Service through Problem-Based learning will evaluate their progress, course description, self-rating, and methods the same as students who experience Quantity Food Production and Service through the traditional lecture-based method is not accepted. LB methods provided more in the way of factual knowledge and one-way communication about the content and purpose on the part of the instructor. PBL methods involved students in their learning more, increased their communication skills, and stimulated them to higher intellectual effort than did LB methods. Perceptions of the class were different between the two teaching methods. Bayard (1994) reported concerns with using PBL for undergraduate dietetics students. She did not find increased retention, increases in self-directed learning skills, or increases in motivational level with this group. Bayard recommended PBL for undergraduates if additional time was provided to reduce their concerns about both knowledge and grading.

One of the greatest difficulties with using PBL in Quantity Food Production and Service has been the lack of tutors for each learning group. Tutors are highly recommended by most authorities in PBL and were not possible in this course. The lack of skilled tutors was not able to be replaced with the instructor and one undergraduate teaching assistant who moved between all of the groups as roving tutors. It could be expected that there would be a higher level of satisfaction with the course if trained, permanent tutors were available.

PROPENSITY FOR PARTICIPATIVE MANAGEMENT

DESCRIPTIVE STATISTICS

Descriptive statistics including frequencies (Table 26) and means (Table 27) were performed on the PPM survey instrument administered to each section both at the beginning and at the end of the course. Independent t tests comparing LB and PBL before the class began and at the end of the class showed no significant differences for any question (Table 27).

It is evident that for four questions (Q13, 16, 18, and 20) the students disagreed with the propositions. These questions are all components of the culture factor (Parnell, *et al.*, 1992). Within their organizations these students as hourly workers with limited experience did not have the opportunity to share in decision making. Participative decision making was not used (Q12), or promoted (Q18). These students did not make their own decisions (Q16), nor were they solicited by their bosses for help in decision making (Q20). In spite of this over 70% of both sections planned to use participative management in the future. They wanted more opportunities to participate and did not have those opportunities in their current or most recent jobs.

Table 26: Frequency of response to PPM questionnaire - LB and PBL sections

Questions	Variables	LB				PBL			
		Before		After		Before		After	
My subordinates/ peers tend to possess the same organizational goals that I have.	SD ^(a)	5	9.3	5	9.1	4	11.4	5	14.3
	D	12	22.2	16	29.1	7	20	7	20
	N	19	35.2	19	34.5	10	28.6	8	22.9
	A	16	29.6	12	21.8	12	34.3	14	40
	SA	2	3.7	3	5.5	2	5.7	1	2.9
Participative decision making requires divulging too much confidential information.	SD	13	24.1	9	16.4	3	8.6	11	31.4
	D	28	51.9	27	49.1	20	57.1	14	40
	N	11	20.4	16	29.1	11	31.4	8	22.9
	A	2	3.7	3	5.5			2	5.7
	SA								
Many organization problems disappear when everyone has a chance to participate in decision making.	SD	1	1.9			1	2.9	2	5.7
	D	9	16.7	7	12.7	5	14.3	2	5.7
	N	16	29.7	18	32.7	9	25.7	15	42.9
	A	23	42.6	25	45.5	18	51.4	14	40
	SA	5	9.3	5	9.1	2	5.7	2	5.7
My subordinates/ peers are generally informed and experienced.	SD	1	1.9	1	1.8	1	2.9	3	5.7
	D	14	25.9	5	9.1	6	17.1		
	N	9	16.7	14	25.5	6	17.1	10	28.6
	A	25	46.3	30	54.5	20	57.1	20	57.1
	SA	5	9.3	5	9.1	2	5.7	2	5.7
Participative decision making is widely used in my organization.	SD	7	13	7	12.7	3	8.6	6	17.1
	D	19	35.2	20	36.4	12	34.3	7	20
	N	11	20.4	12	21.8	9	25.7	12	34.3
	A	14	25.9	13	23.5	9	25.7	8	22.9
	SA	3	5.6	3	5.5	2	5.7	2	5.7
Participative decision making gives too much power to subordinates.	SD	11	20.4	7	12.7	3	8.6	6	17.1
	D	30	55.6	36	65.5	19	54.3	18	51.4
	N	9	16.7	7	12.7	11	31.4	7	20
	A	4	7.4	4	7.3	2	5.7	4	11.4
	SA			1	1.8				
Participative decision making usually results in effective decisions.	SD			1	1.8	1	2.9	1	2.9
	D	5	9.3	1	1.8	1	2.9	2	5.7
	N	10	18.5	14	25.5	4	11.4	4	11.4
	A	28	51.9	30	54.5	27	77.1	24	68.6
	SA	11	20.4	9	16.4	2	5.7	4	11.4
I am free to make decisions as I wish in my organization.	SD	4	7.4	5	9.1	4	11.4	5	14.3
	D	24	44.4	18	32.7	16	45.7	10	28.6
	N	14	25.9	11	20	9	25.7	13	37.1
	A	9	16.7	18	32.7	6	17.1	7	20
	SA	3	5.6	2	3.6				
Subordinates/ peers often can not be trusted.	SD	13	24.1	9	16.7	4	11.4	8	22.9
	D	20	37	21	38.2	21	60	15	42.9
	N	18	33.3	15	27.3	7	20	7	20
	A	2	3.7	8	14.5	3	8.6	5	14.3
	SA	1	1.9	1	1.8				

Participative decision making is promoted within my organization.	SD	3	5.6	2	3.6	2	5.7	3	8.6
	D	19	35.2	19	34.5	11	31.4	6	17.1
	N	10	18.5	16	29.1	10	28.6	12	34.3
	A	20	37	14	25.5	12	34.3	14	40
	SA	2	3.7	3	5.5				
Participative decision making promotes positive relationships at all levels of the organization	SD	1	1.9					2	5.7
	D	12	22.2	2	3.6	1	2.9	1	2.9
	N	32	59.3	11	20	7	20	3	8.9
	A	9	16.7	33	60	27	77.1	25	71.4
	SA			8	14.5			3	8.6
My boss frequently solicits my participation in his or her decisions.	SD	5	9.3	4	7.3	6	17.1	6	17.1
	D	21	38.9	18	32.7	11	31.4	7	20
	N	13	24.1	12	21.8	9	25.7	10	28.6
	A	10	18.5	15	27.3	5	14.3	11	31.4
	SA	4	7.4	5	9.1	4	11.4	1	2.9
I plan to frequently employ participative management techniques in the future.	SD	1	1.9	1	1.8				
	D	2	3.7	2	3.6	1	2.9	1	2.9
	N	12	22.2	9	16.4	13	37.1	7	20
	A	31	57.4	35	63.6	19	54.3	23	65.7
	SA	8	14.8	8	14.5	2	5.7	3	8.6

^(a) SD Strongly Agree - SA Strongly Agree

Table 27: Mean student response to Propensity for Participative Management before and after instruction. mean (\pm standard deviation)

Questions	LB		PBL	
	Before n = 54	After n = 55	Before n = 35	After n = 35
My subordinates/peers tend to possess the same organizational goals that I have.	2.96 (1.03) ^(a)	2.85 (1.04)	3.03 (1.12)	2.97 (1.15)
Participative decision making requires divulging too much confidential information.	2.04 (0.78)	2.24 (0.79)	2.17 (0.71)	2.03 (0.89)
Many organizational problems disappear when everyone has a chance to participate in decision making.	3.41 (0.94)	3.51 (0.84)	3.43 (0.95)	3.34 (0.91)
My subordinates/peers are generally informed and experienced.	3.35 (1.03)	3.60 (0.85)	3.46 (1.09)	3.51 (0.95)
Participative decision making is widely used in my organization.	2.76 (1.15)	2.73 (1.13)	2.86 (0.73)	2.80 (1.16)
Participative decision making gives too much power to subordinates.	2.11 (0.82)	2.20 (0.83)	2.34 (0.72)	2.26 (0.89)
Participative decision making usually results in effective decisions.	3.83 (0.86)	3.80 (0.87)	3.80 (0.72)	3.80 (0.83)
I am free to make decisions as I wish in my organization.	2.69 (1.02)	2.84 (1.15)	2.49 (0.92)	2.63 (0.97)
Subordinates/peers often cannot be trusted.	2.22 (0.92)	2.42 (1.05)	2.26 (0.78)	2.26 (0.98)
Participative decision making is promoted within my organization.	2.98 (1.05)	2.89 (1.07)	2.91 (0.95)	3.06 (0.97)
Participative decision making promotes positive relationships at all levels of the organization.	3.91 (0.68)	3.80 (0.87)	3.74 (0.51)	3.68 (1.08)
My boss frequently solicits my participation in his or her decisions.	2.70 (1.16)	2.93 (1.2)	2.71 (1.25)	2.83 (1.15)
I plan to frequently employ participative management techniques in the future.	3.80 (0.81)	3.84 (0.86)	3.63 (0.65)	3.69 (0.96)

^(a) 1 = strongly disagree, 5 = strongly agree
no significant differences between LB and PBL before treatment or after treatment

COMPARISON OF PROFESSIONAL MANAGERS WITH STUDENTS

Since there were no differences between the student sections before or after the classes, all of the student responses from the second survey (after the class) were combined and compared with the entire group of ADA and NRA members using an independent t test (Table 28). In the culture dimension for five of six variables there was disagreement between students and professionals in the field. For two of three power dimension variables and for one of three organizational variables there were also significant differences. Most of the students (>50%) were employed in traditional hospitality organizations and were short tenure employees. The amount of participation in the workplace does not seem great to them.

For the three questions in the power dimension the mean of student responses was nearer to the NRA response than the ADA response (Table 10). "Participative decision making requires divulging too much confidential information" ADA - $x = 1.85$, Students - $x = 2.16$, NRA - $x = 2.41$. "Participative decision making gives too much power to subordinates" ADA - $x = 1.85$, Students - $x = 2.22$, NRA - $x = 2.26$. "Subordinates/peers often can not be trusted" ADA - $x = 1.96$, Students - $x = 2.36$, NRA - $x = 2.29$.

Table 28: Comparison of NRA and ADA members with students of propensity for participative management - mean (\pm standard deviation).

Questions	NRA/ADA n = 339	Students n = 90
My subordinates/peers tend to possess the same organizational goals that I have.	3.29(1.0)@	2.9(1.08)**
Participative decision making requires divulging too much confidential information.	2.02(0.80)	2.16(0.83)
Many organization problems disappear when everyone has a chance to participate in decision making.	3.66(0.90)	3.44(0.86)*
My subordinates/peers are generally informed and experienced.	3.67(0.89)	3.57(0.89)
Participative decision making is widely used in my organization.	3.18(1.01)	2.76(1.13)***
Participative decision making gives too much power to subordinates.	1.98(0.79)	2.22(0.85)*
Participative decision making usually results in effective decisions.	3.83(0.78)	3.80(0.85)
I am free to make decisions as I wish in my organization.	3.60(1.03)	2.76(1.08)****
Subordinates/peers often can not be trusted.	2.06(0.83)	2.36(1.02)*
Participative decision making is promoted within my organization.	3.49(0.95)	2.96(1.03)****
Participative decision making promotes positive relationships at all levels of the organization.	3.92(0.74)	3.74(0.95)
My boss frequently solicits my participation in his or her decisions.	3.59(1.07)	2.89(1.18)****
I plan to frequently employ participative management techniques in the future.	3.99(0.74)	3.78(0.90)*

@ 1 = strongly disagree, 5 = strongly agree

**** p < 0.0001, *** p < 0.001, ** p < 0.01, * p < 0.05

CORRELATIONS

Correlations of the PPM instrument for the second student survey were conducted (Table 29). Positive correlations were anticipated among questions 9, 12, 13, 16, 18, and 20; among questions 11, 15, and 19; and among questions 10, 14, and 17 (Parnell, *et al.*, 1992). All of the correlations were found to be positive and significant with the exception of the relationships between questions 9:16, 12:16, 12:20, and 14:17. These relationships were all positive, but not significant reflecting, perhaps, too few students. Three of these relationships are in the culture dimension which may also reflect the less prevalent use of participative management for hourly employees in the hospitality industry.

Table 29: Second student survey of PPM - Correlations

	Q9	Q10	Q11	Q12	Q13	Q14
Q10	0.005					
Q11	0.133	-0.035				
Q12	0.434****	-0.029	0.005			
Q13	0.291**	0.100	0.055	0.228*		
Q14	-0.049	0.301**	-0.276**	0.155	-0.154	
Q15	0.100	-0.082	0.505****	0.063	0.089	-0.641****
Q16	0.056	0.117	-0.147	0.146	0.499****	0.060
Q17	-0.416	0.331**	-0.054	-0.349***	-0.186	0.155
Q18	0.229*	-0.031	-0.079	0.324**	0.646****	-0.183
Q19	0.280**	-0.091	0.262*	0.226*	0.180	-0.319
Q20	0.239*	0.017	0.094	0.201	0.527****	-0.111
	Q15	Q16	Q17	Q18	Q19	
Q16	0.056					
Q17	0.018	0.079				
Q18	0.196	0.0505****	-0.146			
Q19	0.462****	0.232*	-0.009	0.240*		
Q20	0.169	0.508****	-0.117	0.666****	0.215	

FACTOR ANALYSIS

The independent variables in the second student survey were subjected to factor analysis (Table 30). The results may not reflect a stable solution with fewer than 100 responses (Hair, *et al.*, 1987). The preliminary eigen values for three factors were: Factor 1 - 3.36, Factor 2 - 2.12, Factor 3 - 1.60. The questions loaded on the same factors as were identified by Parnell *et al.*, 1992 and for the ADA/NRA sample. However, the organization dimension was more important for students and loaded as the second factor as was reported by Parnell *et al.*, but not for the ADA/NRA sample. Questions 9 and 13 loaded on the culture factor and questions 10 and 17 loaded on the power dimension, but the scores were not significant.

Table 30 : PPM questionnaire for students - Factor analysis

		Factor 1 culture	Factor 2 organizat.	Factor 3 power
culture subscale				
9.	My subordinates/peers tend to possess the same organizational goals that I have.	.18	.05	-.50
12.	My subordinates/peers are generally informed and experienced.	.22	.02	-.45
13.	Participative decision making is widely used in my organization.	.71	-.01	-.11
16.	I am free to make decisions as I wish in my organization.	.75	-.10	.20
18.	Participative decision making is promoted within my organization.	.80	.03	-.09
20.	My boss frequently solicits my participation in his or her decisions.	.72	.05	-.03
organization subscale				
11.	Many organizational problems disappear when everyone has a chance to participate in decision making.	-.11	.51	-.04
15.	Participative decision making usually results in effective decisions.	.03	.99	.12
19.	Participative decision making promotes positive relationships at all levels of the organization.	.22	.44	-.06
power subscale				
10.	Participative decision making requires divulging too much confidential information.	.18	-.17	.29
14.	Participative decision making gives too much power to subordinates.	.03	-.64	.15
17.	Subordinates/peers often cannot be trusted.	.09	.04	.83

STEPWISE LINEAR REGRESSION

Analysis of the independent variables (Questions 9 - 20) on the dependent variable (Question 23) was conducted. Stepwise linear regression using the forward selection process was continued through five steps for the second student survey. The addition of questions occurred until no other variable met the 0.5000 significance level for entry into the model. The steps and variables entered are listed in Table 31. The best solution occurred at step 3, $E(3,86) = 25.63$, $R^2 = 33.18\%$, $p < 0.0001$. That is 33% of the variance in intent to use participative management techniques in the future could be explained by three of the twelve questions. When additional questions were added to the equation the statistical significance of the additions was greater than $p = 0.05$. The final equation was: Intent to practice participative management in the future = $0.61 + (0.305)Q15 + (0.224)Q18 + (0.0358)Q19$. All three of the questions which entered the equation were part of the model created by the NRA/ADA data (Table 15). Question 19 was part of the ADA solution (Table 16) and Questions 15 and 18 were part of the NRA solution (Table 17). These results support the suggestion that students responses were more similar to the NRA sample than the ADA sample. It should be noted that the mean response to the last question on each survey (dependent variable) was most positive for dietitians ($x = 4.09$), and significantly less positive for students ($x = 3.78$) and NRA members ($x = 3.76$). Dietitians are more likely to employ participative management techniques in the future than are restaurateurs and students. Additionally for the linear regression for ADA members, six questions explained the variance, five questions explained the variance for the NRA members, and only three question explained the variance for the students.

Table 31: Variables which contribute to students' intention to practice participative management - stepwise linear regression

Step	Question
1	19. Participative decision making promotes positive relationships at all levels of the organization.
2	15. Participative decision making usually results in effective decisions.
3	18. Participative decision making is promoted within my organization.
4	10. Many organizational problems disappear when everyone has a chance to participate in decision making.
5	17. Subordinates/peers often cannot be trusted.

Therefore Hypothesis 3: Students who experience Quantity Food Production and Service through Problem-Based Learning will have the same propensity for participative management as students who experience Quantity Food Production and Service through traditional lecture-based methods is accepted. It may be that fifteen weeks of course work is insufficient to demonstrate to students an advantage of using teams to solve problems. It may be necessary for the instructor to provide explicit comparisons between PBL in the classroom and participative management in the workplace. This was not done in the study to avoid introducing bias into the PPM survey instrument results. Additionally students may not be ready to envision themselves as managers at this stage of their education. Most of their experiences in the workplace have not provided them with the opportunity to participate in decision making or even to observe participative decision making so they may not be ready to consider participation as an option.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

This research was conducted with University upperclass students to determine if the teaching method had an effect on the learning achieved, on student's perceptions about the course, and on the likelihood that students would employ participative management in their future employment. A pilot study was conducted to refine the problems which were to be used in the Problem-Based Learning section of the course and the methods of data collection. Additionally an assessment of the students' preferred learning environment was conducted.

The Propensity for Participative Management instrument was mailed to 1000 members of the National Restaurant Association and the dietetic practice group, Management of Health Care Systems, in order to validate the instrument for managers of foodservice systems. Three hundred and thirty nine surveys were returned (39.9%) all of which were not used for each statistical treatment because of missing responses to some questions.

The study to compare the methods of teaching was conducted during the Fall semester, 1995. A lecture-based class (55 students) was compared with a Problem-Based Learning class (35 students). Assignment to either class was based on the student's preference of the day of class offering. The method of instruction was not communicated prior to registration. Both classes were offered at 8:00 AM. Students were assessed on their knowledge of food and nutrition principles at the beginning of the class. Attendance was taken for all class sessions. One component of the final examination was the same for both classes. This was an eight item essay examination in which the student could choose to answer any five of the questions. An evaluation instrument (IDEA) was completed by the students in both sections (LB - 71%, PBL - 94%). The PPM instrument was completed by both

sections both as a pre-test and as a post-test.

Descriptive statistical treatment of the results consisted of independent and dependent t tests to determine differences between the groups. Inferential statistical tests included correlations, factor analysis, and stepwise linear regression.

The NRA group differed from the ADA group in several ways. NRA members were predominately male and owners of restaurants. ADA members were predominately female and functioned as mid-level managers in health-care facilities. Both groups were well-educated, worked many hours each week, and had many years of management experience. Dietitians reported almost twice as many instances of employee participation programs in their organizations as did restaurateurs. There were significant differences between the two groups in their assessment of the use of power associated with participative management (restaurateurs had more concerns about divulging confidential information and about giving power to subordinates than did dietitians). Restaurateurs reported more promotion of participative management in their organizations than did dietitians. Dietitians were more likely to employ participative management in the future than were restaurateurs.

Students in the two sections of the course were not different when the course began except that LB students had significantly higher GPAs than did PBL students. Their performance on the pre-test was the same and their demographic characteristics were similar. Both classes were comprised of a majority of female, dietetics students with between one fourth and one third of the class majoring in Hotel, Restaurant, and Institutional Management. Students were predominately traditional college-age and were employed overwhelmingly (> 75%) in hourly positions, mostly either traditional hospitality or health care organizations. The majority of students believed the positions they held would contribute useful experience to their future careers. There was no difference between the groups initially in the likelihood to practice participative management in the future.

Attendance in the class was better in the PBL class than the LB class. At the end of the class there were no differences between the sections on the overall performance on the final examination. For one question on menu planning the LB students performed significantly better ($p < 0.05$), but the final grades were not different. There were differences between the two sections on their evaluations of the course. LB students thought they learned more and that the instructor communicated the content and the purpose of the course more effectively. PBL students thought the work was more difficult in their class and that they were more involved in their learning process, were stimulated to higher intellectual effort, and achieved improved communication skills. The intention to practice participative management was unchanged at the end of the course for either section. Students were significantly different from NRA and ADA members in their response to the PPM instrument. They were less likely to trust their subordinates/peers, were less likely to believe that participative management promoted positive relationships in the organization, and were less likely to use participative management in that future than were the combined ADA/NRA professionals.

CONCLUSIONS

Problem-Based Learning is an effective teaching method to be used in Quantity Food Production and Service. Students learn equally well using either PBL or LB methods, but with PBL students are much more actively engaged in the process. Students perceived that they improved their communication skills and were stimulated to higher intellectual effort. PBL students learn to rely on themselves and their team members to learn. They become responsible to and for each other. It is likely that they are also better prepared to become life-long learners than are students educated using LB methods. This study offers no evidence that students are more likely to practice as participative managers in the future as a result of teaching method, but they are also not less likely to become participative managers either.

RECOMMENDATIONS

RECOMMENDATIONS FOR THE USE OF THE RESULTS OF THIS STUDY

Faculty members in hospitality and dietetics disciplines are encouraged to consider Problem-Based Learning as a teaching method for their students. This teaching method allows students to gain experience in working in teams, in being responsible for helping the team to learn and grow, in locating reputable sources of information and integrating the new knowledge into their knowledge base structure, in assessing and evaluating the efforts of the team members, in communication skills, and in creativity. Samenfink (1992) recommended hospitality programs teach team building and leadership to help graduates to empower their employees. Lewis (1993) urged hospitality programs to change the curriculum to encourage among other things, teamwork, interpersonal skills, and communication. PBL certainly enhances these recommended skills.

In order to be effective, support needs to be provided to the student groups to allow them to function well. Faculty who use this method will want to identify and train teaching assistants to tutor the individual groups because undergraduate students appear to have difficulty in assuming a large measure of responsibility for their own learning. In addition, faculty who use PBL as a teaching method need to be explicit about the team building and communication skills the students are learning and how these skills may be transferred to the future positions the students will have in the workplace.

RECOMMENDATIONS FOR FUTURE RESEARCH

There is clearly a difference between restaurateurs and dietitians in their views of participative management. Dietitians appear to be more positive and more likely to use participative management in the future than do restaurateurs. It is not clear whether this result is discipline-based (Dietetics vs. Hospitality), position-based (mid-level managers vs. owners), or gender-based (female vs. male).

Another question that needs to be answered is whether participative management is valued in either industry. In health care, employee participative efforts seemed to be established to some extent. This is less true for the restaurateurs who responded to this survey. Some authors have suggested that the individuals who most approved of participative management are academics and writers, but that people actually in the business world are much less enamored of the concept. If new graduates of either discipline are well-imbued with participative management concepts and then encounter the business world where participation is not prized, will they not be increasingly frustrated by their lack of influence in decision making? Should they survive in the industry, will they not have learned that "in the real world" participation is not valued or practiced? Will students who have been educated to value participative management learn to become more autocratic as a result of working in the industry?

There have been a several studies which have looked at the influence of participative practices on a variety of financial indicators. Those reported studies found that participative practices increased financial performance (Denison, 1984; Kravetz, 1991). Such studies have not been done either in hospitality or healthcare organizations. Demonstration of the financial benefits of participation are needed before there can be any expectation of increasing participation in either the hospitality or dietetics disciplines.

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APPENDIX



DEPARTMENT OF NUTRITION
AND DIETETICS

238 Alison Hall
University of Delaware
Newark, Delaware 19716-3301

October, 1995

Dear Colleague,

I teach Quantity Food Production and Service to undergraduates in the Hotel, Restaurant and Institutional Management Program and the Dietetics Program. As I work with these young people who will be entering the industry in a year or two, I am anxious to provide them with knowledge, skills, and a realistic management philosophy so that they will be effective managers.

I want to learn from you the extent to which participative management is employed in the restaurant and healthcare/institutional industry. I am defining participative management as the process of involving subordinates in the decision-making process. How useful are participative management techniques to you in your business?

I am asking that you complete the enclosed questionnaire and return it to me in the enclosed postage-paid envelope by November 20, 1995. Anonymity of all responses is assured. No persons or institutions will be identified in any report of this research. Code numbers are for the purpose of data analysis.

Many thanks for your participation.

Cordially,

Elizabeth M. Lieux
Associate Professor

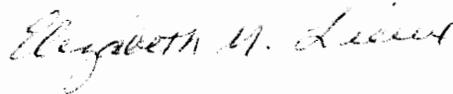
Enclosures:

Questionnaire
Return envelope

AN EQUAL OPPORTUNITY UNIVERSITY

VITA

Elizabeth Young McKinney Lieux was born on December 7, 1939 in Chester, Pennsylvania. After attending public and private schools and graduating from Westtown School, in Pennsylvania, she received a B.S. degree in Home Economics with an emphasis in Foods and Nutrition from the University of Delaware, Newark DE in 1961. She completed a dietetic internship at Brooke Army Medical Center, Ft. Sam Houston, San Antonio TX in 1962. She received a M.S. degree in Nutrition and Food Science from the University of Delaware in 1977, and a M.S. degree in Business from Boston University, Boston MA, 1980. She is married to Roger L. Lieux, Jr. and has two children, Holly and Douglas. Betsy is currently an associate professor at the University of Delaware.

A handwritten signature in cursive script that reads "Elizabeth M. Lieux".