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A Test of Georgopoulos' Model of Organizational Effectiveness

Adapted for Co-operative Education

by

Carol J. Thibault

A thesis submitted to the School of Graduate Studies and Research
in partial fulfillment of the requirement for the degree of
Doctor of Philosophy in Education



Carol J. Thibault, Ottawa, Canada, 1994



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UNIVERSITÉ D'OTTAWA
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DEDICATION

To
Normand Paul Chouinard,
my partner in life

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ABSTRACT

Co-operative education is a popular method of education which links academic study with practical work experience for credit. In Ontario, between 1979 and 1987, enrolment in co-operative education increased from 600 to 36,000 students. The current estimate is that 65,000 secondary school students are involved in co-operative education in the province of Ontario. It was not until 1989, however, that policies and procedures were established by the Ministry of Education in order to standardize the implementation, administration, and delivery of co-operative education.

Those responsible for carrying out the Ministry directives are primarily co-operative education teachers. The effectiveness of co-operative education staff in organizing their departments to provide a high quality of care/service to students, based on these policies and procedures, is relatively unknown. Yet, the concept of organizational effectiveness is important in the study of organizations and their subsystems. Given the trend toward increasing participation in co-operative education, it would seem important to know more about the organizational effectiveness of co-operative education. After a review of the literature, it was felt that the Model of Organizational Effectiveness in a Hospital Subsystem (Georgopoulos, 1986) was a possible framework from which to assess organizational effectiveness in co-operative education.

In this study, a complete description of Georgopoulos' model is provided with a parallel presentation of the adaptability of the model to co-operative education. For Georgopoulos (1986), the emergency department is viewed as a complex, work performing, and problem solving open system which is dependent on the internal and external environment for survival. According to Georgopoulos, organizational effectiveness is the joint outcome of three kinds of efficiency, economic, clinical, and social. As well, he feels there are many factors which facilitate or hinder organizational effectiveness in the department, as an open system. In his model, various elements of structure, including certain inputs, relate to the problem solving adequacy of those who work together to deliver health care. Furthermore, each of the components also relates to the outcomes or organizational effectiveness.

For this study, it was felt that if co-operative education was viewed not as a program but as a subsystem within the school then Georgopoulos' model should seemingly provide a comprehensive framework to study co-operative education. As a result, a model was adapted by the researcher from the work of Georgopoulos (1986). Therefore, the purpose of the study was to test the Model of Organizational Effectiveness Adapted for Co-operative Education in order to determine whether the model was appropriate to assess

relationships among variables which comprise the main components of the co-operative education subsystem, namely inputs, elements of structure, internal problem solving activities, and outcomes.

Due to various limitations including issues of anonymity, sample size, and certain variables which were constant among school boards involved in this study, not all the components of the model were tested. Therefore, a reduced set of variables was included for study. Variables used to test the model included *student inputs* (achievement at the time of entry into co-operative education, level of study, motivation, reason for participating, part-time and volunteer work experiences), *structure* (size and location of school, maturity of co-operative education program, number of students and teachers involved in co-operative education), *problem solving activities* (coordination, integration, strain, adaptation, resource allocation), and three outcomes of *organizational effectiveness* (educational efficiency, achievement, student satisfaction).

The study sample included 21 Ontario secondary schools, 648 senior co-operative education students, and 89 teachers involved in the administration and delivery of co-operative education. Guidance personnel who counsel students for co-operative education were also included in this latter group.

The study findings indicated that the model was useful as a preliminary exploration of relationships among various components of co-operative education as a subsystem. Each student input was related to certain problem solving activities and outcomes of organizational effectiveness (educational efficiency, achievement, student satisfaction). In general, structure variables were related to certain problem solving activities and two outcomes of organizational effectiveness (educational efficiency, student satisfaction). As expected, problem solving activities were interrelated; however, their relationships with the primary outcome of organizational effectiveness (educational efficiency) were not as high as expected. Educational efficiency was highly related to the secondary outcome of organizational effectiveness (student satisfaction) and minimally related to achievement.

The results confirmed that the variables included in this study show validity for Georgopoulos' model as a comprehensive framework for the study of co-operative education as a subsystem. All variables, met to some extent, the expectations derived from the model.

Certain limitations of the study affected the strength of some of the relationships. Problem solving was a school measure and with a small sample size (N=21) it was difficult to show significant relationships. As a school measure and because of the issue of anonymity, it was impossible to match individual teachers to students. Also certain variables were not as reliable as one would have liked. Overall, however, it is anticipated

that with improvements in the research design, modifications to the research instruments, a more diverse and larger sample size, and more direct measures between teachers and students, variables which did not meet the expectations of the researcher might show increased relationships upon further study.

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CHAPTER I

INTRODUCTION

In 1989, the Ontario Ministry of Education developed policies and procedures to guide the implementation, administration, and delivery of co-operative education programs in secondary schools. Until this time co-operative education programs were approved as pilot projects and largely functioned in isolation without provincial coordination and standardized guidelines. Through creative partnerships, education, business, industry, and labour pooled their resources and collaborated to develop programs to improve the educational system and the quality of human resources. There were many factors which contributed to the growth and popularity of co-operative education. High rates of secondary school drop-outs, unemployment among youth between 15 and 24 years of age, student and parental concerns about the relevancy of education, a competitive and technologically advanced labour market, and financial restraint in every sector of the economy were just some of the reasons why educators started to turn to co-operative education for possible solutions.

Despite support for co-operative education by satisfied students, teachers, parents, and employers, there are concerns about the educational merit, academic credibility, and effectiveness of co-operative education. Some of the concerns can be traced to conflicting philosophies of education, but the larger problem has been the limited amount of research generated since co-operative education was first introduced in North America in 1906 (Wilson, 1988). Much of co-operative education research has been from a program perspective and is mostly applied, descriptive, and survey research. Almost all of the research has been conducted with post-secondary institutions in the United States. Little research on co-operative education has been conducted in Canada.

This study is about organizational effectiveness of co-operative education. The concern is not with the school as an organization, but with the co-operative education department as a subsystem and how effectively it is organized to provide high quality care and service to students in co-operative education. The literature and research on school effectiveness, while interesting, has been linked primarily to elementary schools and student achievement as measured by standardized tests. Effective schools have been identified as those which possess certain characteristics. In general, the focus has been on issues related to classroom management, instructional leadership of the principal, school

structure, culture and climate of the school, and strong external support. Given the nature of co-operative education and the previous focus on co-operative education from a program perspective, it was felt that school effectiveness research did not reflect the unique problems associated with co-operative education nor provide help for understanding the duality of learning environments and the complexity of co-operative education as a system.

Some efforts have been made by researchers to develop models and theoretical frameworks to facilitate the exploration of relationships among components of co-operative education (Branton, VanGyn, Cutt, Loken, Ney, & Ricks, 1990; Fletcher, 1990; Guskin, 1993; Heinemann, 1983; Heinemann, Defalco, & Smelkinson, 1992). However, these models and frameworks are not fully developed; they lack sufficient information and the empirical support which are necessary to contribute to one's understanding of co-operative education.

Therefore, a model of organizational effectiveness adapted from Georgopoulos (1986) was used in this study because of its open-system perspective and its application to a subsystem. In the model, organizational effectiveness is a joint outcome of three types of efficiency: clinical, economic, and social. It is further shown in the model that certain aspects of structure, including inputs, and problem solving relate to the organizational effectiveness of the subsystem. These variables have received very little recognition in the literature on co-operative education.

Georgopoulos' model provides a theoretical framework from which the perceptions of students are examined in regard to the organizational effectiveness of co-operative education as a subsystem. Furthermore, predictions from the model regarding the relationships among student inputs, structure, problem solving activities, and organizational effectiveness are tested. Relationships are specifically examined which include variables that relate to problem solving, educational efficiency, achievement, and student satisfaction. As well, interrelationships among certain variables are also tested.

This study includes six chapters. Following this introduction, the second chapter is an overview of the research on organizational effectiveness. Also included is an examination of Georgopoulos' (1986) Model of Organizational Effectiveness in a Hospital Subsystem and its adaptation for co-operative education. In the third chapter, the variables selected for the study are described. This is followed by a description of the research instruments, research sample, methods for data collection, and data analysis. The fourth chapter includes the results of the study with discussion. A discussion of the relevance of the model is presented in the fifth chapter. In the final and sixth chapter, limitations of the research, contributions of the study, and recommendations for future research are presented.

CHAPTER II

ORGANIZATIONAL EFFECTIVENESS AND A THEORETICAL FRAMEWORK

This chapter consists of five sections. First is a general overview of the literature on organizational effectiveness. In the second section, Georgopoulos' Model of Organizational Effectiveness in a Hospital Subsystem is presented. Third is a discussion of the application of Georgopoulos' Model for co-operative education. Fourth is a discussion of the research in co-operative education. The final section includes the statement of the problem.

Overview of Organizational Effectiveness

Hoy and Miskel (1991) believe that the concept of organizational effectiveness is central to one's understanding of how organizations function. This is consistent with other researchers who view organizational effectiveness as the ultimate dependent variable in research on organizations (Cameron & Whetten, 1983; Goodman, Pennings, & Associates, 1977).

Contributions made by researchers over the years have provided a number of theoretical models from which to assess organizational effectiveness. In general, four types of theoretical models have emerged; these include the goal model, the systems model, the constituency model, and multiple models.

The traditional approach in the assessment of organizational effectiveness has been the *goal model*. In this model, organizations are viewed as mechanisms for the achievement of specific goals (Price, 1968). In general, there are two types of organizational goals which are identified in the literature (Etzioni, 1964; Parsons, 1960; Perrow, 1970; Yuchtman & Seashore, 1967). First, are the goals which reflect the prescribed goals or the formal charter of the organization. Second, are the goals which reflect the derived goals or the actual operating procedures and policies of the organization. The goals are used to provide the criteria for the assessment of organizational effectiveness (Scott, 1977). In general, there has been a shift from the univariate or single output criterion, to a combination of criteria (Steers, 1975; Van de Ven, 1980). Some criteria selected by researchers have included measures of performance, productivity, profitability, job satisfaction, absenteeism, and staff morale (Etzioni, 1964; Georgopoulos & Mann, 1962; Mahoney & Wetzel, 1969; Miles, 1980; Price, 1968; Scott, 1977). Some

researchers have used the goal model to reflect innovative approaches including, management by objectives, organization development, and cost benefit analysis (Campbell, 1976; Child, 1974; Cunningham, 1977).

Despite the regular use of the goal model, consensus among researchers is usually related to the important role that goals play in the study of organizational effectiveness (Hoy & Miskel, 1991; Mott, 1972; Steers, 1975). Many problems have been expressed in regard to using the goal model. Those problems have been related to 1) Who determines the goals (Hoy & Miskel, 1991; Zammuto, 1982, 1984)? 2) What are the goals (Katz & Kahn, 1966; Kirchhoff, 1977; Price, 1972; Yuchtman & Seashore, 1967)? 3) What level of analysis is appropriate, individual, organization, or society (Cameron, 1985; Cameron & Whetten, 1983)? and 4) What criteria are relevant and comparable across different organizations (Cameron, 1985; Georgopoulos, 1986; Price, 1972)? However, according to Katz and Kahn (1966), measuring how well an organization achieves its goal does not provide sufficient information about the internal relationships or how well the organization interacts with its environment.

Their concerns led researchers to think about how organizations function using a *systems model*. The focus moved away from a limited appraisal of outcomes related to organizational goals to a broader appraisal of the organization as a whole. The organization is viewed as a dynamic open system comprised of interdependent parts which interact with the environment.

According to Georgopoulos (1986), knowledge of open system theory is important in organizational research. As open systems, organizations have certain common properties (Evan, 1976; Georgopoulos, 1972, 1986; Katz & Kahn, 1966; Thompson, 1967). Based on the work of these researchers, eight properties are common to open systems. 1) *The wholeness of the organization which is the uniqueness created from the collective contribution of all its parts*. This property is what gives the organization its identity and differentiates it from the environment. 2) *The system cycle of inputs-throughputs-outputs and dependence upon the external environment*. As a condition for survival, the organization must import various forms of energy and information from the external environment. Various internal processes transform this energy and information into products, services, or information. These are then exported or returned to the environment and the cycle is repeated. 3) *The permeability of the boundaries to facilitate transactions between the organization and the environment*. This is the relative porosity of the boundaries which permits the exchange of resources. 4) *The differentiation of structures and functions towards specialization*. The component elements, subsystems, members, and roles tend to become more elaborate and specialized. 5) *The*

interdependence among these component elements of the system. The organization cannot exist without the interaction of these elements with each other and to the total system. 6) *The regularity and patterning of human activities into social roles and clusters of roles.* The subsystem of the organization is an example of human activity which is nonrandom, ordered, and regular. 7) *The relative continuity or stability of the system exhibited over time.* Organizations are dynamic, changing, and adaptive systems, but they strive for equilibrium or a steady state. 8) *Equifinality, or the likelihood the organization will produce identical outcomes regardless of different system inputs, structures, and processes.* In organizations, there are many ways to achieve similar results. It is unlikely that there can be one best way which works for all organizations. According to Georgopoulos (1986), these properties which are common to open-system organizations may vary from one system to another. These basic system properties may be directly or indirectly interrelated and have relationships which may be mutually enhancing or opposing.

Furthermore, Georgopoulos (1972, 1975, 1978, 1986) believes that organizations are also characterized by a property which is reflective of the collective *problem solving capacity of the system*. In general, this is the ability of the organization to resolve and manage certain internal problems which are inherent in all organizations. Furthermore, he feels the potential capacity for problem solving may not be realized to the fullest extent in the organization or system.

System theory is mainly about problems of relationships, interdependence, structure, and process (Hoy & Miskel, 1991; Katz & Kahn, 1966). Researchers have applied the systems model for the assessment of organizational effectiveness in many ways and at various phases of the system cycle. Some researchers assessed organizational effectiveness in terms of the relationship between the organization and the environment during the input phase of the system cycle. This became known as the system-resource model and effectiveness was viewed as the ability of the organization to survive and grow through the acquisition of valuable resources from the environment (Katz & Kahn, 1966; Yuchman & Seashore, 1967). The main concern about this application of system theory was related to the acquisition of resources at the expense of the outputs (Cameron, 1985; Hall, 1972; Hoy & Miskel, 1991). Other researchers examined internal system relationships such as leadership, decision-making, communication patterns, and role performance to increase one's understanding of organizational effectiveness (Friedlander & Pickle, 1968; Katz & Kahn, 1966; Stewart, 1976). Some linked organizational effectiveness to properties of a social system. Cummings (1980) felt effectiveness was dependent on the degree of congruence between the internal social system components and

external environment. For Mott (1972) effectiveness was the ability of the organization to mobilize its centres of power toward the the production of better outputs and greater adaptation to environmental and internal problems. Georgopoulos (1986), taking a view that was more encompassing, involved all the major components of the system cycle and included multiple constituent perspectives. For him, organizational effectiveness is the ability of the system to produce high quality and cost efficient outputs. In order for this to happen, the system must be able to perform in an efficient and reliable manner. As well, the system must be capable of providing adequate solutions to certain enduring problems inherent in an open-system. Georgopoulos also indicated that success in dealing with major problems of the system increases the performance potential of individual components. Furthermore, he feels the problem-solving capacity of the system is somewhat contingent on how the organization is structured.

The combined efforts of the systems theorists have contributed to one's understanding of the complexity of relationships between the organization and the environment and among the component parts. In general, however, many researchers did not take into consideration the role of the constituents or stakeholders in their assessment of organizational effectiveness.

Therefore, the *constituency model* of organizational effectiveness emerged in which criteria were developed to reflect the preferences of constituents. In this model, effectiveness is the degree to which an organization is responsive to constituent preferences. For some researchers, effectiveness criteria were drawn from a single perspective reflecting either the dominant or power coalition, strategic constituency, or prime beneficiary (Cameron, 1978; 1981; Cameron & Whetten, 1983; Goodman et al., 1977; Thompson & Orton, 1985). Other researchers developed criteria of effectiveness which reflected many different stakeholders or constituent perspectives in the organization (Chelladurai, 1987; Connolly, Conlon, & Deutsch, 1980; Georgopoulos, Cooke, & Associates, 1980; Jobson & Schneck, 1982; Keeley, 1984; Pfeffer & Salancik, 1978; Tsui, 1990; Zammuto, 1982, 1984). To a certain extent, some researchers viewed the constituency model as an integration of the goal and system models (Connolly et al., 1980; Zammuto, 1982, 1984). These researchers felt that the identification and integration of appropriate constituent goals included an understanding of the system processes.

As for other models of organizational effectiveness, researchers have expressed a number of concerns in regard to the constituency model. Firstly, constituent groups (internal and external) must be identified (Cameron & Whetten, 1983). Secondly, constituent perspectives represent different value systems which result in conflicting and biased views on the criteria selected to assess organizational effectiveness (Goodman,

Atkin, & Schoorman, 1983; Keeley, 1984). Thirdly, the divergent needs of constituent groups cannot be equally satisfied at the same time (Zammuto, 1982, 1984). Therefore, Connolly et al (1980) recommended that empirical studies on organizational effectiveness should take into consideration, constituent satisfactions, as well as issues of location, change, and time.

In an effort to recognize that all models contribute in different ways to one's understanding of the construct of organizational effectiveness, Cameron and Whetten (1983) suggested a framework based on *multiple models*. They felt that multiple models, with various perspectives, would integrate in a more effective manner 1) the complexity of the open-system and internal processes, 2) the multi-dimensionality of organizational effectiveness including achievement toward goals, and 3) the involvement of constituent groups. Furthermore, they felt that a clearly defined framework which identified the research parameters would facilitate comparisons across different organizations. Of interest in their approach to the assessment of organizational effectiveness was their seven decision guidelines. In general, these included questions related to 1) the constituent perspective selected to judge effectiveness, 2) the domain of activity, 3) the level of analysis, 4) the purpose for judging effectiveness, 5) the time frame considered, 6) type of data, and 7) the frame of reference to assess effectiveness.

Other researchers advocated to some extent, a combination of models consistent with certain aspects of Cameron and Whetten (1983). For example, Hoy and Miskel (1991) suggested that organizational effectiveness could be better understood by expanding on the goal and system models to include the dimension of time, organizational level, multiple constituencies, and effectiveness criteria. Earlier, Campbell (1976) felt a convergence of the goal and system models was needed if the organization failed to achieve its goals. In order to understand the reasons for failure, an investigation of the system components, including the perspectives of open-system, rational goal, human relations, and internal process, is necessary.

In summary, there are valid reasons to consider the assessment of organizational effectiveness from the goal model, the systems model, the constituency model, or multiple models. Each has merit despite the different emphasis. In a goal model the focus is on the achievement of goals as measured by output criteria. In a systems model the focus is on the components of system, the environment, and their various relationships. In a constituency model the focus is on the stakeholders of the organization. In a multiple model the focus may include all of the above models or some combination. According to Scott (1977), general explanations of organizational effectiveness should be avoided in order to test specific predictions which relate effectiveness measures to characteristics of

organizations or their systems. As well, Hoy and Miskel (1991) support the open-systems model as a framework for combining the various perspectives on organizational effectiveness.

Georgopoulos' (1986) model of organizational effectiveness is an interesting model to guide researchers and increase one's understanding of the relationships among the components of an open-system. This complex model of organizational effectiveness was designed for comparative research in hospital emergency departments. However, he feels it is an appropriate model to consider in the assessment of organizational effectiveness in other types of organizations. The model is in some ways a multiple model. Not only does Georgopoulos rely on open-system theory, but he takes into consideration the assessment of organizational effectiveness by different constituents. Furthermore, he uses the model to explain relationships among the inputs and outputs of the system, the internal structure and processes, and intervening problems which facilitate or hinder organizational effectiveness.

This comprehensive approach to the study of organizational effectiveness in a subsystem is particularly favorable in terms of trying to understand co-operative education within the school system. Co-operative education has never really been studied as a system. In most of the research, co-operative education has been described and evaluated as a program, yet, there are many factors, internal and external, which influence the delivery and administration of co-operative education. Some models were developed that are unique to co-operative education. For example, Fletcher (1990) proposed a theoretical framework to illustrate the elements of co-operative education which increase self esteem so that co-operative education educators can design and implement programs which provide more systematic benefits. Branton et al (1990) proposed a model of co-operative education for the assessment of learning benefits. In their model, various principles of learning (practice, internal context, reinforcement, learning styles, self-efficacy, modes of practice, transfer, learning to learn, motivation to learn, and retention) are considered applicable for the assessment of learning outcomes in co-operative education. Learning specifically related to the acquisition of knowledge was considered by Heinemann et al (1992). They proposed a work-experience enriched learning model based on the concept of knowledge and its relationship to education and experience. Earlier, Heinemann (1983) proposed the TAR Model based on Bloom's classification of educational goals. In this model, the process of learning in co-operative education begins with the classroom teaching (T) of concepts which are subsequently applied (A) on the work assignment and then reinforced (R) through analysis, synthesis, and evaluation when students return to the classroom. Guskin (1993) advocates a co-operative education experience which fosters learning as it relates to three types of intelligence (analytic, creative, adaptive). He would like to see

researchers in co-operative education apply this theory of intelligence in solving three major societal problems including leadership to serve others, adaptation to change and risk-taking, and cultural sensitivity.

However, while these models are interesting, they have not been sufficiently developed for use, nor do they have empirical support. Consequently, it was felt that an adaptation to co-operative education of Georgopoulos' Model of Organizational Effectiveness in a Hospital Subsystem (1986) had greater potential to provide new information to understand more fully the relationships in co-operative education from a system perspective.

Georgopoulos' Model of Organizational Effectiveness in a Hospital Subsystem

There are three purposes for this section. The first is to briefly discuss the work of Georgopoulos and others which led to the development of the Model of Organizational Effectiveness in a Hospital Subsystem. The second is to conceptualize the work of the subsystem and how it functions. The third is to present the three major components of the model including organizational effectiveness, structure, and problem solving. Integrated within the presentation of the model are discussions of the relationships among the various parts.

Development of the Model

Georgopoulos has been actively involved in hospital research for over thirty years. On many occasions he was the sole researcher (Georgopoulos, 1965, 1972, 1975, 1978, 1986). Often, however, he worked in collaboration with other researchers (Georgopoulos et al., 1980; Georgopoulos & Mann, 1962; Georgopoulos & Matejko, 1967; Georgopoulos & Tannenbaum, 1957; Georgopoulos & Wieland, 1964).

Despite many decades of research in organizational theory, Georgopoulos (1986) noted that research in the emergency services field, particularly related to organizational effectiveness, was very limited. He found that the researchers had primarily concentrated on four areas 1) the demography of emergency unit users, 2) severity and urgency of patient conditions, 3) financial costs related to ambulatory services, and 4) case studies on decision making and patient problems or medical protocol. He expressed concern about the small number of comparative organizational studies, the lack of varied research methodology, and the need for improved measurement criteria related to quality of care, economic efficiency, and patient and staff satisfaction. As well, Georgopoulos (1986)

noted that researchers in health care had not conducted a rigorous or systematic investigation of the complex problems of emergency unit (EU) organization and effectiveness. In an effort to guide the structuring and managing of subsystems to facilitate problem solving and promote organizational effectiveness, Georgopoulos (1986) proposed a complex model of organizational effectiveness.

The conceptual-theoretical framework used by Georgopoulos (1986) was developed based on the results of earlier hospital studies (Georgopoulos, 1972; 1975; Georgopoulos et al., 1980; Georgopoulos & Mann, 1962; Georgopoulos & Matejko, 1967). An earlier version of this framework is described in Georgopoulos (1978).

This model is based on an open-system perspective with application for research in human service organizations (Georgopoulos, 1986). According to Georgopoulos (1972, 1986), the hospital system is similar to other complex organizations which are organized and structured to perform certain functions and achieve particular goals. Furthermore, he believes all complex organizations are problem-solving systems which operate within a dynamic environment.

The main focus of the model, therefore, is on the relationships among three key areas of the system. These areas include *organizational effectiveness* (the outcomes) of the system, the organization of the system in regard to *structures* (including relevant inputs), and the *problem solving adequacy* (through-puts) of the system (Georgopoulos, 1986).

First, is the concept of *organizational effectiveness*. According to Georgopoulos (1986), organizational effectiveness is the ability of the organization to achieve and maintain outputs which are high in quality, sufficient in quantity, and cost efficient. The ability of the organization to maximize its performance potential to accomplish these objectives is contingent on other factors. These include adequate structures and the resolution of problems common to all organizations. The concept of organizational effectiveness used by Georgopoulos is an integration of the work of many other researchers (Cameron & Whetten, 1983; Etzioni, 1964; Evan, 1976; Goodman et al., 1977; Katz & Kahn, 1978; Mott, 1972; Price, 1968; Steers, 1975; Thompson, 1967; Yuchtman & Seashore, 1967).

Second, the various *structures* encompassed by the system relate to elements within the environment, the parent organization, and the subsystem. These structures impact on the problem solving adequacy and organizational effectiveness of the system (Georgopoulos, 1986; Georgopoulos et al., 1980).

Elements within the environment are complex and, according to Hoy and Miskel (1991), the boundaries of an open-system are somewhat ambiguous. So, while the community constitutes the external environment of the parent organization, the parent

organization constitutes part of the external environment for the subsystem. Elements of the external environment may be demographic characteristics of the people in the community (e.g., socio-economic status, education, language, and culture), complexity of the labour market (e.g., stable or uncertain), availability of certain resources (e.g., human and material), and the nature of certain forces which influence organizational functioning (e.g., lobby groups and related associations).

Elements related to the parent organization may include structures which members rely on to do their work, help to regulate member behaviour, and facilitate problem solving. Structures which pertain to the roles and activities of members, the communication patterns, and the normative and authority structures, and the size of the organization are important.

Elements of the subsystem may include structures related to the diversity of service, size and autonomy, and qualifications of members. These structure elements may be formal or informal, stable or unstable, concrete or abstract, and can be interconnected (Georgopoulos, 1972, 1986).

Third, the *problem solving adequacy* of the system is related to five major problems which must be adequately solved to achieve effectiveness (Georgopoulos, 1986). These include problems of coordination, integration, strain, adaptation, and resource allocation. A framework for the system's problem solving adequacy has been continually refined by Georgopoulos (1972, 1975, 1978). Similar problems were identified by other researchers (Evan, 1976; Georgopoulos & Matejko, 1967; Katz & Kahn, 1966, 1978; Mott, 1972; Thompson, 1967). Furthermore, the problem oriented models of Georgopoulos (1972, 1975, 1978) have been empirically tested in other studies (Argote, 1982; Cheng, 1977; Cooke & Rousseau, 1981; Georgopoulos et al., 1980; Longest, 1974; Sutton & Ford, 1982).

One of the interesting aspects of the model, proposed by Georgopoulos (1986), is the application of organizational theory related to organizational effectiveness in a subsystem. Georgopoulos (1986) views the subsystem of a complex organization as a semiautonomous entity, characterized by basic system properties, and structured to achieve objectives. Consequently, the effectiveness of the subsystem can be understood using theory relevant for organizations. Tsui (1990) suggested that open-system logic permits one to view subunits within organizations as micro-organizations. This is consistent with Clegg and Dunkerley (1980), who suggested that one way to understand the overall system is to examine the subsystem. Therefore, an illustration of the emergency unit as a subsystem in a hospital setting is appropriate to understand the relevance of open-system

theory, the significance of structure, and problem solving adequacy for the assessment of organizational effectiveness.

Emergency Unit as a Subsystem

According to Georgopoulos (1986), the emergency unit, as a subsystem of the hospital, is one of the most complex and problematic departments in the hospital. In order to provide individualized patient care activities, the emergency unit must use a very specialized and sophisticated work technology and deal with a variety of problems associated with input, output, internal structure, and process. The work conditions are highly variable and the patient inputs from the environment are uncertain.

Autonomy of the emergency unit is limited by its dependence on the parent organization and various other subsystems. It relies on other departments for cooperation, services, and support while at the same time competing for resources from the parent hospital. In addition, professional staff must work within the policies and rules of the parent hospital and maintain acceptable standards in carrying out the clinical activities. The cooperative and collective efforts of the staff are essential for the coordination of patient care activities. Yet, Georgopoulos (1986) feels some degree of tension is inevitable as members seek personal fulfillment from the system and try to cope with the demands of the work environment. As a result, it is not surprising that there is the potential for major problems to arise at various points along the input-transformation-output cycle of the system (Georgopoulos, 1986). Success in dealing with these major problems of the system is a reflection of the problem-solving capacity of the system. The greater the problem-solving capacity, the greater the likelihood that the performance potential of individual components will materialize (Georgopoulos, 1972, 1975, 1978, 1986). Furthermore, according to Georgopoulos (1986), the manner in which the organization is structured is important to ensure unity of action toward organizational objectives, to minimize uncertainty, and to aid in the resolution of the major system problems.

Therefore, Georgopoulos (1986) believes that the effectiveness of the subsystem is determined mainly by certain structural characteristics and the adequacy of the subsystem to solve certain problems. What follows is a detailed description of the model proposed by Georgopoulos (1986) (see Figure 1).

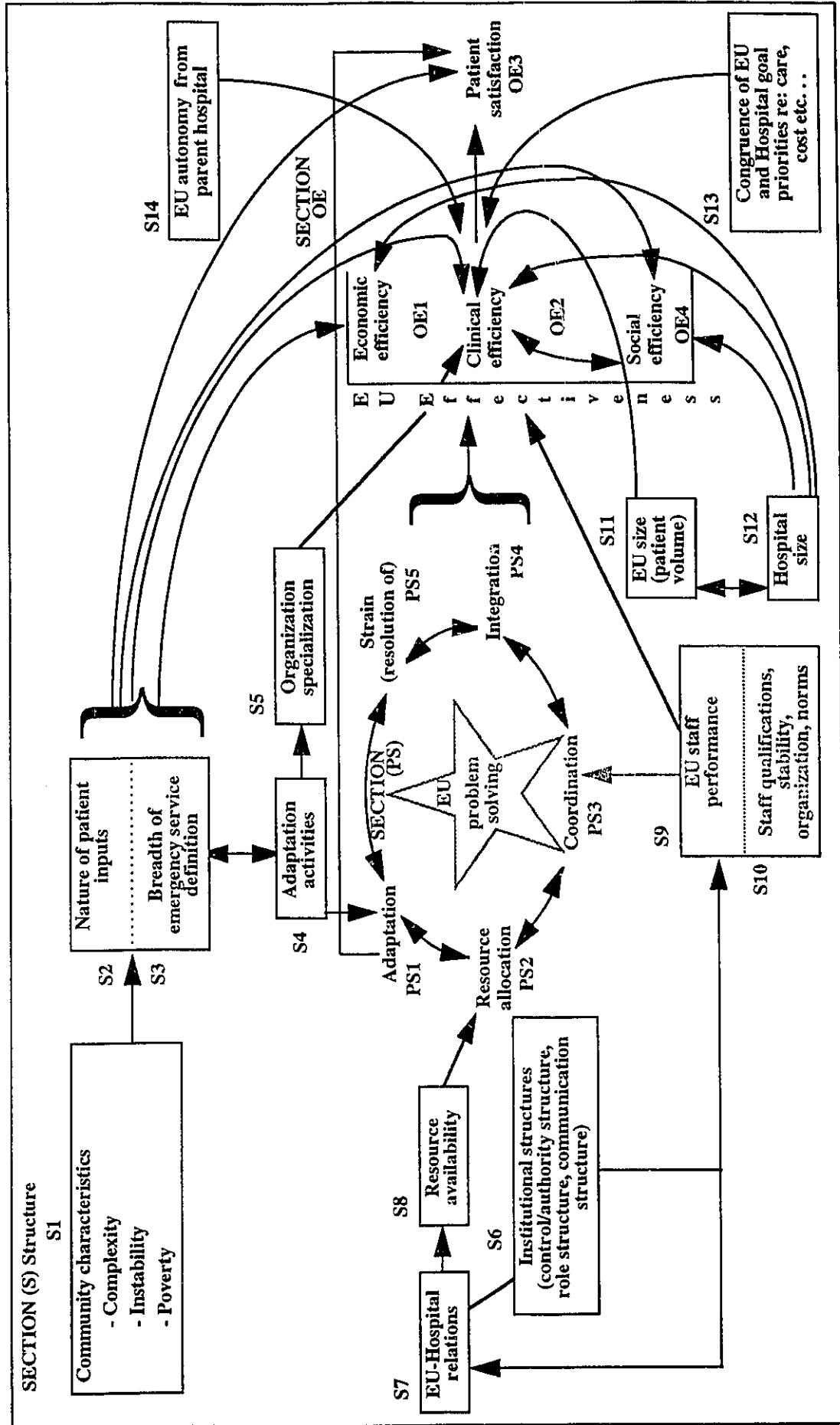


Figure 1. Model of organizational effectiveness in a hospital subsystem

(Source: Georgopoulos, B. (1986). Organizational Structure, Problem Solving and Effectiveness (p.23).)

The Model

Consistent with the overall complexity of the construct of organizational effectiveness, the model proposed by Georgopoulos (1986) for the emergency unit (EU) subsystem is intricate with many interrelated components. These components represent the input-throughput-output cycle of an open-system and its relative dependence on the external environment. Because of the nature of the open-system and the interplay among the system components and the direct and indirect relationships with the environment, it is difficult to neatly package and discuss the model. The model is at best a graphic representation of many complex aspects of organizational effectiveness in a subsystem with a cycle of inputs, through-puts, and outputs. This cannot be fully understood, however, without some reference to the parent organization, of which the subsystem is a part, and to the environment.

The three major parts of the model presented include *organizational effectiveness* (outputs), *structure* (which includes relevant subsystem inputs), and *problem solving adequacy* (through-puts) (see Figure 1).

Organizational Effectiveness

The first concept discussed is that of organizational effectiveness. It is important to begin with this concept because all other aspects of the model relate either directly or indirectly to the effectiveness of the subsystem. As an output variable, *EU effectiveness* (Figure 1, Section OE) is located on the right hand side of the model. According to Georgopoulos (1986), organizational effectiveness in a very general way is the ability of the system to achieve and maintain high levels of output without unnecessary strain on participants and the available resources. The outputs may be in the form of products, services, information, or some combination of these. High levels of output are achieved in terms of quality, quantity and cost, acceptability, and related criteria (Georgopoulos, 1986). More specifically, however, Georgopoulos (1986) views the effectiveness of the subsystem as a joint (but not equally weighted) outcome of three types of efficiency: *economic efficiency*, *clinical efficiency* (including *patient satisfaction*), and *social efficiency*. (Figure 1, OE1 to OE4). A description of each type of efficiency follows.

Economic efficiency. The cost associated with the provision of patient care is *economic efficiency* (Figure 1, OE1). Economic efficiency is usually thought of in terms of a ratio of input to output. According to Georgopoulos et al (1980), the economic efficiency of the subsystem reflects how well available resources are being utilized.

Economic efficiency, therefore, relates to the ratio of revenues to expenditures, fees charged to costs incurred, and professional hours worked to number of patients served. From the client and community perspective, Georgopoulos (1986) says that the cost of services must be affordable and reasonable. This ensures that health care is available for those in need. From the hospital perspective, the subsystem must be productive and efficient in its use of the financial and staff resources. This prevents shortages of resources in other areas of the hospital. As a result, the degree of economic efficiency and use of resources may impact on public attitudes about health care, staff performance and satisfaction, and relations with the parent organization (Georgopoulos et al., 1980).

Clinical efficiency. The quality of care provided to clients is the *clinical efficiency* (Figure 1, OE2). According to Georgopoulos et al (1980), quality of care is the main outcome and principal output of staff performance. It is reflected by the excellence of staff performance which is considered the core component of clinical efficiency. Furthermore, they say that quality of care is concerned with all phases of the care process. As a result, clinical efficiency involves the patient from the point of entry in the subsystem to the point of exit from the subsystem. According to Georgopoulos (1986), clinical efficiency is dependent on the appropriateness of clinical practices and procedures, the competence and sufficiency of staff resources, the congruence of goal priorities, the appropriateness of facilities and structures, and the nature of problem solving. The degree of clinical efficiency in turn has implications for *patient satisfaction* (Figure 1, OE3). Maintaining a high level of patient satisfaction was one of the goal priorities of the hospital staff. For patients or clients, it is the overall satisfaction with the care received and the manner in which they were treated by the hospital staff. Georgopoulos (1986) expressed concern that patients may be less capable than professional employees of making sound technical judgments in regard to the quality of care. However, he feels that patients are the most qualified to assess the extent to which they are satisfied with the care they receive.

Social efficiency. The satisfaction of the members who work in the subsystem is *social efficiency* (Figure 1, OE4). According to Georgopoulos (1986), social efficiency is a reflection of the concern for participants as human beings regardless of their roles or status in the system. It involves the attitudes of members to perform their work and the satisfaction they receive from their efforts. Attitudes and satisfaction are contingent on many factors including the working conditions, the type of work performed, and the benefits derived (Georgopoulos et al., 1980). Furthermore, they impact on members' motivation to perform and feeling of value within the organization. For members then,

social efficiency is job satisfaction and the recognition that they have personal needs, separate goals, values, and expectations which need to be integrated with the basic goals of the organization (Georgopoulos, 1972). Social efficiency is interrelated with clinical efficiency. Efficient and high quality service provided by staff members impacts on staff satisfaction and vice versa.

Structure

The second part of the model includes elements of *structure* which are located primarily around the outside edges of the entire boxed area (Figure 1, Section S, S1 to S14). In this model, structure includes certain elements of the external environment, parent organization, and the subsystem. However, because of their scattered positions on the model, and the lively interplay among these elements (as reflected by the arrows), it is probably more appropriate to discuss elements of structure according to three subsets or groups of variables. As a result, variables in the subsets may represent elements of structure from the environment, the organization, and the subsystem, or some combination. According to Georgopoulos (1986), structure is the relatively stable arrangement of the concrete or abstract elements which are encompassed by the system. Structures minimize uncertainty, serve as a frame of reference, ensure unity of action, and facilitate decision making and problem solving.

The first subset includes five variables which are located in the top left quadrant of the model (Figure 1, S1 to S5). This subset consists of elements of the external environment, the organization, and the subsystem. The first variable, which represents the external environment, is *community characteristics* (Figure 1, S1). This element includes characteristics of the population base from which the organization receives clients. The *complexity* of the community in regard to various demographic characteristics, including socio-economic status (e.g., *poverty*), impacts directly on the organization in regard to patient inputs. Given the type of work done by the emergency unit, the composition of patient inputs is not predictable or certain at any given time. Therefore, the *instability* of patient composition combined with the other community characteristics determines the *nature of patient inputs* (Figure 1, S2). The composition of inputs also has implications for the *breadth of emergency service definition* (Figure 1, S3). The type and scope of services provided, as well as the work and performance requirements of the members, are determined by the needs of the clients who use the subsystem and the severity of their medical condition. As well, the breadth of emergency service, which is determined by client composition and medical condition, also has consequences for the outcomes. According to Georgopoulos (1986) the narrower the emergency services offered, the

higher the quality of care (clinical efficiency) and patient satisfaction, while the broader the services offered, the greater the economic efficiency. Breadth of emergency service is also linked to social efficiency. In general, it appears that breadth of emergency service has a negative correlation with social efficiency, the broader the range of service, the lower the satisfaction of staff. Furthermore, because of the nature of patient inputs and the uncertainty of the emergency care required, *adaptation activities* (Figure 1, S4) are required in order for the subsystem to continually cope with changing client needs, medical conditions, and the various work demands. Not only do these adaptation activities impact on the problem solving adequacy, which is discussed in the following section, but they determine the areas of *organization specialization* (Figure 1, S5). In an emergency unit, for example, the frequency of particular conditions might necessitate special treatment facilities such as poison control, trauma, or burn centres with highly specialized staff. According to Georgopoulos (1975), the main advantage of specialization is that it simplifies the process of synthesizing and applying vast amounts of available knowledge. But Georgopoulos (1975) also feels that increased specialization, which increases work and member interdependence, may isolate members from the organization and escalate competition among members. He feels that elaborate coordination, effective communication, and member cooperativeness are necessary to minimize the negative affects of specialization. The degree of specialization, therefore, has implications for the clinical and social efficiency of the subsystem.

The second subset of structure elements consists of five variables which are located in the bottom left quadrant of the model (Figure 1, S6 to S10). At the hub of this subset are variables that relate to the *institutional structures* (Figure 1, S6). According to Georgopoulos (1986), the specialized delivery systems of the hospital and emergency unit are a combination of mechanistic and organic structures. They function, in part, based on bureaucratic procedures, programmed activity, and authority relations. Formal institutional structures define the role and task structure of the members, provide rules and regulations of operation and behaviour, and determine patterns of communication. However, the organization and subsystem also function based on professional autonomy, informal communication, and coordination by mutual adjustment. These structures, in turn, affect and relate to several others. Institutional structures have a direct link to the *EU-hospital relations* (Figure 1, S7). Relations between the hospital and emergency unit involve mechanisms for monitoring the work of the subsystem, the training of staff, the patterns of staffing, and the relationships among the hospital administration, the subsystem staff, other departments, as well as relationships with the community. Since the subsystem is dependent on the parent organization for resources, including staff to do the work, the EU-

Hospital relations and linkages are related to *resource availability* (Figure 1, S8). Available resources represent the funds required to operate the organization, the facilities, supplies, and equipment needed to service the organization, the information required to plan and function, and, most important, the people required to perform the work. Resources must be appropriately allocated and distributed to provide individualized services to the clients. The allocation of resources has further implications for other aspects of problem solving. These are addressed below. According to Georgopoulos et al (1980), positive work relations among the subsystem, parent organization, and environment are essential to effective performance. In order for the members to provide high quality care and accommodate patient needs, the organization must select appropriate staff and provide opportunities which enhance the knowledge of members and improve their skills. Therefore, institutional structures and relations also dictate to some extent the *EU staff performance* (Figure 1, S9). According to Georgopoulos (1986), these structures provide a base on which members can rely to carry out their tasks and activities. Staff performance, therefore, is contingent on *staff qualifications* (Figure 1, S10) of the members who perform the work. The training, skills, competence, and experience of professionals and specialists, their employment *stability*, their belief in the *organization*, and their commitment to behave according to the *norms* of the organization affect the work performance. In order to provide individualized, quality care for clients, members interact frequently within a highly structured, specialized, interdependent, and standardized work environment. The activities and tasks to be accomplished are divided among a variety of roles and members with different skills and knowledge. The efforts and contributions would be ineffective if not coordinated and made to converge toward the solution of organizational problems and system outcomes (Georgopoulos, 1986). Therefore, staff performance is related to problem solving and to the overall effectiveness of the subsystem. As well, Georgopoulos (1972) believes that staff performance determines the ability of the system to achieve social efficiency. Social efficiency is achieved when staff have a high level of commitment, loyalty, and involvement, including a genuine sense of satisfaction with the work they do.

The third subset of structure elements consists of four variables which relate directly to the organizational effectiveness of the subsystem (Figure 1, S11 to S14). According to Georgopoulos (1986), *Hospital size* (Figure 1, S11), based on the number of beds or the patient capacity, is related to clinical and social efficiency. Georgopoulos (1986) notes that hospital size is not related to economic efficiency, but neither does it impede economic efficiency. This inconsistency is reflected in the model which shows a relationship to economic efficiency. Larger hospitals provide higher quality of care than

smaller hospitals. As well, larger hospitals are likely to have more satisfied staff. At the same time, they are almost as cost efficient as the smaller sized hospitals (Georgopoulos, 1986). The size of the hospital also determines, to some extent, the *EU size (patient volume)* (Figure 1, S12). Hospital size and patient volume according to Georgopoulos (1986) correlate highly with each other. EU size is the number or volume of patients that actually receive emergency care. Unlike hospital size, patient volume is more likely to affect economic efficiency. Hospital size and patient volume have complementary effects on the performance of the system; both affect clinical efficiency. The quality of patient care may be better in larger hospitals and in hospitals which have a higher patient volume in emergency care. In addition to size and patient volume, Georgopoulos (1986) also feels that *Congruence of EU and hospital goal priorities* (Figure 1, S13) is important to consider in achieving organizational effectiveness. In order to facilitate effectiveness, Georgopoulos (1986) feels it is essential for the organization and subsystem to be in agreement on the priority of goals to be achieved. Some examples of goals which reflect concerns associated with the clinical, economic, or social efficiency include 1) achieving high standards of patient care, 2) maintaining high levels of patient satisfaction, 3) keeping costs down, and 4) improving conditions of work (Georgopoulos et al., 1980). In general, goal priorities related to clinical efficiency and patient satisfaction are more important to staff in the emergency unit than goals related to costs and working conditions. As a result, goal priorities in this situation affect the clinical efficiency of the subsystem. The final structure variable is *EU autonomy from parent hospital* (Figure 1, S14). According to Georgopoulos (1975), the people who perform the work in the subsystem are professionals and specialists with expert knowledge and technical competence required to perform their roles. These professionals expect a certain amount of autonomy in making decisions regarding the health care of their clients. However, there are constraints imposed on these professionals and specialists in regard to hospital rules, regulations, and standards of operation which limit the autonomy of those who deliver the care (Georgopoulos, 1986). The greater the autonomy, however, the more likely the quality of patient care is individualized and personalized according to the unique requirements of the patient and his/her condition (see arrow from S14 to Clinical efficiency).

In summary, according to Georgopoulos (1986) structures are largely determined by the environmental context, the organization of the parent hospital, the nature of the work to be done, the character and qualifications of the staff, and certain basic system properties including differentiation, interdependence, patterning, and continuity. Members rely on structures to perform their roles and tasks. In turn, structures promote organizational continuity, regulate and control the members' behaviour and task performance, and aid in

the resolution of work problems. Structure variables are expected to affect both problem solving and the effectiveness of the system.

Problem Solving

Five *problem solving* activities are located around the star in the centre of the model (Figure 1, Section PS, PS1 to PS5). Georgopoulos (1986) believes that organizational effectiveness depends on the subsystem's ability to deal with and adequately solve problems in the areas of *adaptation, resource allocation, coordination, integration, and strain*. These multifaceted problems, common to all organizations, are related to system properties as well as to one another. Georgopoulos (1972) also says that these problems may appear at different points of the input-throughput-output cycle. As well, he feels these problems can occur at both the individual member level and collectivity level. Georgopoulos (1972) recommends that the problems be examined first at the collectivity level. The ability of the subsystem to provide satisfactory solutions to problems, in turn, depends on the resources (especially human) and environmental conditions and includes problems of input, output, internal structure and process, and external affairs problems. According to Georgopoulos (1986) continuous effort is required to resolve these major problems which are recurring and not equally pressing at all times. Furthermore, he feels these problems and their interrelationships must be understood in order to find adequate solutions and maximize the effectiveness of the system in regard to its economic, clinical, and social efficiency. The five problem solving activities identified by Georgopoulos (1986) are interdependent and interrelated. The adequacy of problem solving in one area affects to some extent the adequacy of problem solving in another area. Georgopoulos (1986) suggests that these effects may be direct or indirect, strong or weak, positive or negative. In general, however, Georgopoulos (1986) notes that positive relationships exist among all five problem solving areas. Successful problem solving in one area facilitates problem solving in another area. A discussion of the problems identified by Georgopoulos (1986) is presented below.

Adaptation. There is a continuous interaction and exchange between the organization and the environment. In order to carry out its work and achieve organizational objectives, the organization must obtain energy and resources from the external environment. According to Georgopoulos (1975), the organization must solve *adaptation* (Figure 1, PS1) problems related to instability and change in the environment and respond to and influence the environment. Adaptation includes relationships between the subsystem and environment, the reputation of the hospital within the community, the

degree of collaboration for services and information, the adequacy of information exchanged, and the responsiveness to changing needs and expectations of the community (Georgopoulos, 1986). As well, in order for the subsystem to adapt to the external environment certain structures are necessary. For example, adaptation activities and strategies are needed to facilitate the exchange of information and collaboration for services, to respond to changing needs, and to improve the hospital's reputation within the community. Furthermore, according to Georgopoulos (1986) the relations with the external environment have implications for problem solving in other areas and for organizational effectiveness. Georgopoulos (1986) feels that positive relations and successful collaboration facilitate the exchange of information needed to provide appropriate services and care for patients. This, in turn, affects the availability of resources, including professionals and specialists. Furthermore, he feels that good relations with the external environment improve the reputation of the organization. As a result, patients benefit by receiving a higher quality of care. Successful adaptation, therefore, is related to clinical efficiency and patient satisfaction (Georgopoulos, 1986).

Resource allocation. In order to accomplish its work toward the achievement of objectives, Georgopoulos (1986) feels the subsystem must be able to solve problems related to *resource allocation* (Figure 1, PS2). Resources in the form of labour, information, funds, equipment, supplies, and facilities are required to provide individualized care and service to the clients. Georgopoulos (1986) feels problems of resource allocation are linked to structural elements such as the availability of resources and the relations between the hospital and emergency unit. Georgopoulos (1975) believes resource allocation involves the ability of the organization to manage staff problems related to composition, distribution, work specialization, and task definition. Consequently, relations between the subsystem, the parent organization, and the environment may determine the availability and sufficiency of resources. Furthermore, the satisfactory allocation of resources among various groups and members whose work roles are interdependent is also related to other problem solving areas. For example, resources must be allocated according to changing needs and expectations of the community. As well, insufficient resources may impact on the amount of strain among various members. This then may impact on the degree of member integration. Consequently, resource allocation may facilitate or hinder problem solving and the economic, clinical, and social efficiency of the subsystem.

Coordination. In general, Georgopoulos (1975, 1986) refers to *coordination* (Figure 1, PS3) as the activities and efforts of members toward the solution of work problems and the achievement of organizational objectives. More specifically, coordination includes the planning and timing of tasks, how well jobs fit together, and the extent of joint staff efforts to facilitate and adjust their work activities. While it is expected that there will be some advanced planning and scheduling of activities, Georgopoulos (1986) suggests that adequate coordination is mostly achieved through informal cooperation, good communication, and spontaneous adjustments. This is related to the uncertainty and heterogeneity of patient inputs. Georgopoulos (1972) believes that elaborate and flexible coordination of work efforts is particularly important when diverse and specialized activities converge around the patient (client). Successful coordination is related to certain structure elements. Structures which define the roles and activities of the staff who carry out the health care as well as the qualifications and competencies of the staff to do their jobs determine, to some extent, the ability of the subsystem to coordinate effectively. The adequacy of coordination also impacts on problem solving in other areas. If coordination is effective, the result is better allocation of resources, greater adaptation to the environment, higher integration, and a greater ability of the subsystem to resolve strain. The adequacy of coordination in turn is related to the economic, clinical, and social efficiency of the subsystem. The importance of coordination for organizational functioning is supported by previous research (Georgopoulos & Mann, 1962; Georgopoulos & Matejko, 1967; Likert, 1967; Mintzberg, 1979; Thompson, 1967).

Integration. *Integration* refers to the social-psychological involvement of members in the system (Figure 1, PS4). According to Georgopoulos (1975), common purposes, shared norms, and values help socialize individuals into the system. Members have various roles to play as they provide care for their clients. These roles are highly specialized, interdependent, and require collective and coordinated efforts. The work performance of one member can affect the work performance of another. In order to promote efficient and reliable performance, job satisfaction, high morale, and compliance with the objectives of the organization, Georgopoulos (1975) believes that the organization must facilitate both the role performance and personal goal attainment of its members. At the same time, however, he feels the organization must also eliminate obstacles which deter individual freedom, limit participation, and make work relations difficult. The level of integration has implications for other problem solving areas. While good integration is expected to facilitate coordination, poor integration may escalate the amount of strain among members. As well, the level of integration also has implications for the

organizational effectiveness of the subsystem. When the level of integration is higher, it is expected that there will be more individual loyalty and commitment to the work at hand and more support and appreciation among principal groups in the system. As a result, good integration can facilitate staff satisfaction or social efficiency, which, in turn, impacts on performance and clinical efficiency (Georgopoulos, 1986). The importance of integration for organizational effectiveness was supported in other research (Georgopoulos, 1972, 1975, 1978, 1986; Georgopoulos et al., 1980; Katz & Kahn, 1966, 1978).

Strain. The level of *strain* (Figure 1, PS5) or tension among those who work in a system and among interacting groups, whose cooperation is essential, is important to consider in the achievement of organizational effectiveness. Strain may be caused by many factors including poor communication, inappropriate leadership, lack of joint planning and mutual understanding, inadequate problem solving, and structural deficiencies. While some strain is expected in a complex social system (Georgopoulos & Matejko, 1967), the total amount of strain is more significant than the source of the strain (Georgopoulos, 1986). Strain which is left unchecked can have a direct effect on the performance of staff members and, therefore, hinder the ability of the subsystem to resolve problems of adaptation, integration, and coordination (Georgopoulos & Matejko, 1967). Consequently, the social and clinical efficiency of the subsystem is greater when there are low levels of strain. This does not hold true, however, for economic efficiency. Georgopoulos (1986) found no direct relationship between the amount of strain and economic efficiency. In order to increase organizational effectiveness, Georgopoulos (1986) feels that organizations must resolve the problems and manage the tensions which arise. Success in resolving strain may prevent the system from becoming dysfunctional.

The adequacy of problem solving in one area is related to the adequacy of problem solving in another area. In general, these interrelationships are positive, but correlation patterns and size of relationships will vary. As well, the adequacy of problem solving for adaptation, resource allocation, coordination, integration, and strain is most consistently and directly related to the clinical efficiency of the subsystem, but not to economic efficiency. Coordination relates best to clinical efficiency, patient satisfaction, and social efficiency. Integration facilitates problem solving in other areas and relates to social efficiency or staff satisfaction, but it is not related to effectiveness as strongly as the other problem solving areas. Georgopoulos (1986) suggested that integration may not have been appropriately measured. Adaptation to the external environment, particularly in regard to collaboration and meeting community expectations and needs, relates to clinical efficiency

and patient satisfaction, but not to economic efficiency. Georgopoulos (1986) noted that these relationships in regard to adaptation to the external environment are more direct than those found between community characteristics and subsystem effectiveness. The amount of strain hinders social efficiency, clinical performance, and patient satisfaction, but not economic efficiency. Economic efficiency of the health service depends more on structure but not on internal problem solving, whereas clinical efficiency depends on both structure and problem solving. Georgopoulos (1986) suggests that the financial situation of the hospital may not be a direct concern of those who perform the care. This is consistent with the fact that cost of patient care was not a goal priority of those performing the care. The contribution of problem solving in the different areas of effectiveness varies from one criterion to another, but it accounts mainly for differences in clinical efficiency and patient satisfaction.

In summary, the model is an attempt to explain and understand organizational effectiveness in an open system. As an open system, there are certain basic properties which reflect the dynamic and adaptive nature of the organization and its relative dependence on the external environment. The organization is comprised of many parts. The subsystem of the emergency unit is one of those parts which makes a significant contribution to the whole organization. As a subsystem, it cannot accomplish its work in isolation from the rest of the organization. The subsystem is dependent on the environment and the parent organization for resources (including patient inputs) and interdependent on other subsystems within the organization for additional resources, services, and support. The work of the subsystem is highly specialized to meet the needs of clients with diverse medical conditions. This tendency toward increased specialization is natural in open systems. Roles and tasks of members become more specific and more narrowly defined. This, in turn, increases the interdependence among the components. The system is also structured to minimize uncertainty, to establish stability and continuity which members can rely on to perform their work, and to enhance relationships among the components of the system. These structures are essential in the provision of quality patient care. However, as an open system there are problems encountered at each point of the input-throughput-output phase of the system cycle. The ability of the subsystem to resolve these problems relates to the outcomes of organizational effectiveness. Furthermore, the structure of the system has consequences for the adequacy of problem solving and on the outcomes of the system. As a result, organizational effectiveness, the joint outcomes of clinical, economic, and social efficiency, is largely determined by organizational structures and the adequacy of the subsystem to resolve major problems that may be encountered along the entire work cycle.

According to Georgopoulos (1986), this model, which is based on open-system theory, includes related elements of structure and problem solving which in turn may hinder or facilitate organizational effectiveness in a subsystem. Furthermore, he feels the theoretical framework is relevant for research in other organizations which share these common properties. Although the structure and the degree of problem solving adequacy may differ from organization to organization, they have implications for the effectiveness of the subsystem. Therefore, it should be an appropriate model to use in co-operative education which can be viewed as an open system. As a subsystem of the school, co-operative education has an input-throughput-output cycle, common system problems, and certain structures to facilitate work performance and organizational effectiveness. The next section is an adaptation of Georgopoulos' Model of Organizational Effectiveness to co-operative education.

Application of Georgopoulos' Model to Co-operative Education

In order to understand the relevance of Georgopoulos' model of organizational effectiveness for co-operative education, it is important to describe co-operative education as it currently exists in the secondary school system in Ontario. Following this description, an adaptation of Georgopoulos' Model of Organizational Effectiveness, with relevance to co-operative education, is presented.

Description of Secondary School Co-operative Education

Co-operative education in Ontario is an approved method of experiential learning (Ministry of Education, 1989). Through partnerships with business, industry, and labour, secondary school students are provided with opportunities to integrate their classroom studies with appropriate work experiences in the community. Generally, each school has some autonomy to develop co-operative education according to the needs of its students and the nature of the supporting community. However, policies and procedures are in place to standardize the components of co-operative education, establish academic credibility, and maximize the learning outcomes for students consistent with the overall aims of education.

The delivery of co-operative education is carried out by teachers in the school. Each school has one teacher designated to act as the coordinator. The coordinator reports directly to either the principal or vice-principal. For the most part, the coordinator organizes, plans, and directs the work in co-operation with teachers, guidance counsellors,

and support staff. Together, these people comprise the co-operative education department. The degree of responsibility assigned to each teacher varies depending on the overall number of students and staff involved in co-operative education. Much of the work is also contingent on the co-operation of employers in the external environment who provide the job opportunities for students. Therefore, the recruitment of employers, primarily by the coordinator, is an on-going process.

Secondary school students from all grades and all levels of learning (basic, general, advanced) have access to co-operative education. Interested students select co-operative education as an option in the school year prior to their participation. Since co-operative education is still largely an optional program, entry into co-operative education is based on a selection process. The purpose is to determine the student's eligibility and the potential for co-operative education to meet his/her needs. This process includes a formal application and a series of interviews with guidance and co-operative education staff.

In schools which operate on a semester system, co-operative education may be offered in one semester, or in both semesters. Whenever possible, students participate in co-operative education in the semester of their choice. There is no limit on the number of times students can register for co-operative education, but reasonableness is expected. The daily timetable for students in co-operative education is usually split equally between school and work. Typically, students receive three credits for co-operative education. This includes one credit of 110 hours for the in-school component and two credits of 220 hours for the out-of-school component or work experience.

For one half of each day students take a number of courses in school. Only one course is designated as the in-school component or *related school subject*. This subject, whenever possible, is closely related in content to the student's anticipated work placement. It is highly recommended that students take a related course concurrently with the work experience. Subjects are chosen from across the curriculum. This means that students, as a group, have related courses from different disciplines. For example, a student who wants to work as an interior decorator might have as a related subject, Fine Arts. Similarly, a student who wants to work in an architect's office might have a course in Computer Drafting. The related school subject is taught by a teacher who is designated as a *co-operative education teacher* or co-operative education monitor. This person has certain co-operative education responsibilities which may include the preparation of a student job training plan, the design of relevant homework assignments, the regular visits to students at their workplace, the use of student and employer feedback to enrich certain concepts taught in class, and the interaction with other co-operative education staff to exchange related information. The total number of co-operative education teachers within the school at any

given time is contingent on the course interests of co-operative education students and the availability of appropriate courses.

For the other half of the day students experience the world of work. Before students actually begin to work, they spend twenty classroom hours in preparation for the transition to the work environment. Usually, the coordinator is responsible to prepare the students for work. However, responsibility may be shared with other co-operative education teacher monitors and involve resource personnel from the community. Before the preparation phase is completed, students go through an interview with a perspective employer. The purpose of this interview is to match the students with appropriate employers. In a good match, the interests, skills, and abilities of the student are congruent with the expectations of the employer. Following the in-school preparation for work, students begin the actual work component.

At work, a supervisor is designated to be responsible for the student and all that she or he does. In some cases, the employer may be the student's supervisor. Because of the number of employers and supervisors involved with the students, the diversity and nature of the work to be accomplished, and the many demands made on the employers' time, it is essential that a teacher monitor the student's progress on a regular basis. It is highly recommended that the teacher who visits the student be knowledgeable about the student's field of work.

Throughout the semester, students are released from work at scheduled times to return to the classroom for reflective learning and integration activities. At this time, all co-operative education students meet with the coordinator or teacher monitor to exchange information about their work experiences and to complete assignments and various paper work required for the evaluation of their co-operative education experiences.

The evaluation process is on-going throughout the work term and involves the students, co-operative education teachers, and employers. In order to maximize the learning outcomes, it is important that students be actively involved in the assessment of what they have learned and where they need to improve. A variety of evaluation measures including employer reports, student diaries and journals, job-related assignments, and class participation are used to award credits for the successful completion of co-operative education.

In summary, co-operative education is a dynamic system. Many people within the school and community are involved in the learning and growth process for co-operative education students. In order to achieve the goals of co-operative education, the staff must work directly with a variety of departments within the school environment to provide an academic component and with a number of employers in the external environment to

provide a work experience component. Throughout the entire process, a great deal of the work is individualized for students. In addition, the staff involved in co-operative education must observe constraints imposed by the nature of their work, the Ministry of Education, and by the external environment. Therefore, structures are organized and defined to accommodate this complex environment and the work is carried out by the co-operative education staff who must interact and relate with one another, with those from other departments, and with a diverse group of employers. Consequently, the staff must rely heavily on the co-operation, service, and support from a number of personnel both within the internal and external environment. As a result, there is a potential for conflict or tension arising from the competition for needed resources, the interdependence among the various components, the diverse nature of the work, and the constraints imposed upon co-operative education.

To further conceptualize co-operative education, it can be viewed as a complex task-oriented and problem-solving system that is organized and structured to provide certain educational services to students. While the process in its entirety is also shared by employers in the external environment, the internal organization within the school holds the greatest potential for study. The administration and delivery of co-operative education is regulated by provincial policies and procedures, whereas involvement from employers in the external environment varies from one type of organization to another and lacks standardized procedures for achieving goals. Heinemann (1983) has recommended that schools take full responsibility for formulating, directing, and evaluating the educational objectives from the co-operative education experience because reliance on the employer is not very promising. When co-operative education is viewed as a subsystem, an adaptation of Georgopoulos' Model of Organizational Effectiveness in a Hospital Subsystem is a relevant perspective for determining which factors relate to the effectiveness of co-operative education.

Adapted Model of Organizational Effectiveness in Co-operative Education

Consistent with the Model of Organizational Effectiveness in a Hospital Subsystem (Georgopoulos, 1986), this section is a presentation of the three major parts of the model adapted for co-operative education (see Figure 2). The adapted model includes organizational effectiveness, structure (including relevant student inputs), and problem solving. The adapted model is very similar to the one developed by Georgopoulos (1986); however, there are a few differences. First, the terminology used in the adapted version is

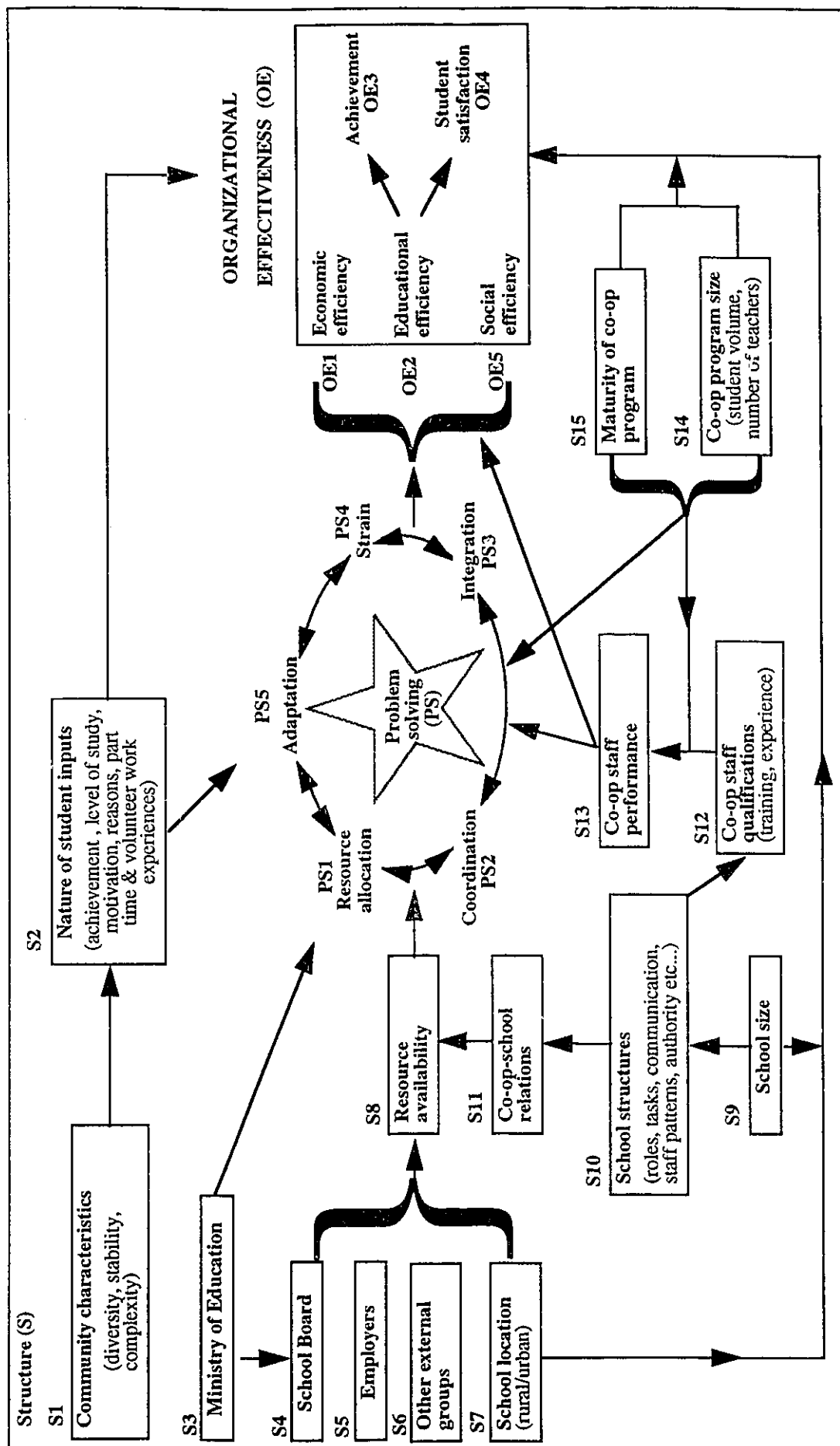


Figure 2. Model of organizational effectiveness adapted for co-operative education

Legend:
 Structure = S1 - S15
 Problem Solving = PS1 - PS5
 Organizational Effectiveness = OE1 - OE5

typical of the language commonly used in schools. For example, Georgopoulos' clinical efficiency term is replaced with the term educational efficiency. Second, the variables selected and their arrangement reflect the uniqueness of co-operative education. Georgopoulos (1975) noted that each organization has its own particular features in addition to the common properties found in complex social systems. Third, the predicted relationships among variables vary to some extent. Georgopoulos (1986) noted that aspects of structure, problem solving adequacy, and organizational effectiveness are interrelated and that the relationships among these variables may vary considerably depending on the organization.

- A description of the three major sections of the adapted model is presented in the following order: organizational effectiveness, structure, and problem solving.

Organizational Effectiveness

The main section presented here is that of organizational effectiveness, located to the right in the model (Figure 2, Section OE). Georgopoulos (1986) generally views organizational effectiveness as the production of high quality and cost efficient outputs without strain on participants and resources. In the hospital, organizational effectiveness centres around the provision of high quality patient care. Similarly, for co-operative education, organizational effectiveness is centred around the ability of the department to provide high quality care and service to students in co-operative education. More specifically, the provision of high quality care and service is the joint (but not equally weighted) outcome of three types of efficiency: economic, clinical (educational), and social.

Economic efficiency. Georgopoulos (1986) speaks about economic efficiency in terms of the ratio of inputs to outputs. He links economic efficiency to very tangible things like the amount of time physicians and nurses spend with a patient, the payroll expenditures of support staff per patient, and the total cost to the hospital for patient care. In co-operative education, *economic efficiency* (Figure 2, OE1) is very much linked to the wise and efficient use of resources. The public pays for schools to educate students. The money invested in the education of students has implications for the future of individuals as well as for society in general. On one hand, then, economic efficiency would include the cost of co-operative education per student. This is reflected by the salary costs for teachers who work with co-operative education students and the expenses incurred for support services and material resources. However, this is a very short term and narrow perspective of economic efficiency. If one were to consider the potential benefits of co-operative

education to society, then economic efficiency takes on a much broader scope. For example, if co-operative education keeps students from dropping out of school, shortens the transition period from school-to-work, adequately prepares students for employment, and helps students make wise decisions regarding post-secondary education, then presumably taxpayers receive higher returns on their investment. Society benefits from having individuals who contribute in productive ways without draining the financial resources. These costs are less tangible, but they have implications for the economic efficiency of co-operative education.

Educational efficiency. Georgopoulos (1986) spoke of clinical efficiency as reflected by excellent staff performance in providing high quality care to patients. The term clinical is appropriate for hospitals, but in this model the quality of care/service students receive while in school and at their workplace is *educational efficiency* (Figure 2, OE2). Educational efficiency is reflected by the quality of work performed by the staff and employers involved in co-operative education. This includes all teachers who administer, deliver, and implement co-operative education programs, guidance personnel who counsel students for participation in co-operative education, as well as employers and supervisors who substitute as educators while the students are involved in co-operative education. Quality of care/service begins when students first receive counselling for participation in co-operative education and ends when they receive the final evaluation of their performance. Therefore, components of educational efficiency represent all phases of the input-throughput-output cycle of co-operative education and include expected outcomes related to 1) the co-operative education counselling process, 2) the in-school academic subject, 3) preparation for work, 4) the out-of-school work placement, 5) monitoring on-the-job, 6) classroom integration activities, and 7) the evaluation process. The quality of care and service that students receive while in co-operative education has implications for secondary outcomes related to *student achievement* (Figure 2, OE3) and *student satisfaction* (Figure 2, OE4). One would expect that a high quality of care would result in students who achieve higher marks. Likewise, students who receive a high quality of care are likely more satisfied.

Social efficiency. Georgopoulos (1986) considers social efficiency as a reflection of the attitudes of those who provide patient care in regard to their work and the satisfaction they get from their efforts. In co-operative education, however, the satisfaction of the participants who deliver the care and service to students, *social efficiency* (Figure 2, OE5), includes staff within the school as well as employers in the environment. Social efficiency

is affected by the attitudes of those who work together, the nature of the work to be performed, and the working conditions. In general, however, social efficiency has to do with how those responsible for program delivery feel about working in co-operative education. It includes their enjoyment of the work they do, their satisfaction with their work relationships, their sense of appreciation and recognition for their efforts, and the benefits they receive.

In order to achieve organizational effectiveness in co-operative education, many factors must be considered. Georgopoulos (1986) suggests that structure and problem solving adequacy of the system account for differences in organizational effectiveness.

Structure

For Georgopoulos (1986), structure includes concrete and abstract elements which affect problem solving and impact on organizational effectiveness. In the adapted model, elements of structure are arranged mostly on the left side in the model and across the bottom (Figure 2, Section S). These elements of structure include variables related to the external environment, the school organization (system), and the Co-operative Education Department (system) (Figure 2, Section S, S1 to S15). Variables related to structure are presented in four groups or subsets.

The first group of structure elements involve a wide array of variables which represent people and organizations in the external environment. *Community characteristics* (Figure 2, S1), including the *complexity* of demographic features of the people as parents and guardians of students (e.g., ethnicity, socio-economic status, religious affiliation, language, education), determine to some extent the *nature of student inputs* (Figure 2, S2). The school has very little control over the students who enter the system. As a result, students enter co-operative education with varied characteristics. These characteristics, in turn, impact on the problem solving adequacy and organizational effectiveness of the department. *Achievement* varies among students who participate in co-operative education. Student achievement may range from high-risk low achievers to self-assured high achievers. While achievement of students is based on a standardized grading system, the level of course difficulty also reflects achievement potential. Presently in Ontario secondary schools, students, except those in grade 9, select courses from a number of *levels of study* (basic, general, advanced) with possible implications for future education. It is expected that students taking courses at the basic level are preparing for the labour market, students taking courses at the general level are preparing for college or some alternative type of post-secondary education, and students taking courses at the advanced level are preparing for university. For example, high-risk students may require additional

work effort in regard to job placement and supervision. Student participation in co-operative education is determined by their *motivation*. For some, the level of motivation may be greater than for others. This may have to do with the *reasons* why students participate in co-operative education. Some take co-operative education to test out a career interest. Some take co-operative education to gain valuable work experience or to help make decisions regarding employment or post-secondary education. Still others see co-operative education as a chance to earn easy credits or to break the routine of school. As a result, the recruitment of job placements should reflect the needs of students. The previous work experiences of students (*part-time and volunteer*) who participate in co-operative education are also important characteristics. Students who are more familiar and comfortable with the work environment through previous experiences may have a better idea of what they want from the program, require less preparation for work, have an easier school-to-work transition period, and be more experienced in dealing with various work situations.

Five other variables of structure within the external environment (Figure 2, S3-S7) have implications for *resource availability* (Figure 2, S8). Resource availability also impacts on problem solving and educational efficiency. For example, the *Ministry of Education* (Figure 2, S3) encourages all school boards to offer co-operative education in the secondary school system and provides policies and procedures for co-operative education. These policies and procedures set the standards by which co-operative education is administered and delivered in order to maximize the learning outcomes for students. The expectation is that all schools develop, implement, and deliver co-operative education according to these standardized guidelines; therefore, they impact directly on the problem solving ability of the department. The *school board* (Figure 2, S4) facilitates the implementation of Ministry of Education directives. In Ontario, all school boards offer co-operative education, but not all schools within a board may offer co-operative education. The role played by the school board in co-operative education varies. When funding from the federal government was available, many school boards were able to hire full time board co-operative education coordinators to facilitate the exchange of information, coordinate employer resources among schools, administer the annual budget, organize professional development, liaise with trustees, and consult with school co-operative education coordinators in regard to program development, expansion, and public relations. However, with government cutbacks, many of these positions have been eliminated and those remaining have added responsibilities apart from co-operative education. For example, in one Board of Education in Eastern Ontario, the board co-operative education coordinator is responsible for co-operative education, physical education, and technical

education. Only 20 percent of the time is designated for co-operative education. As a result, many board coordinators are not involved in the daily operation of co-operative education in the schools. Their efforts, however, may impact on the availability of resources and relations with the community.

The external environment is also comprised of *employers* (Figure 2, S5). Co-operative education is a partnership between schools and employers. Without employers, co-operative education would not exist. Employers in the community represent various sectors of the economy. Characteristics of employers, as reflected by their social conscience, employment diversity, and economic stability, also have implications for resource availability. The attitudes of employers and their willingness to participate in co-operative education determine whether a partnership can be established. The nature of the work done by employers and the employment diversity in the community determine the potential work opportunities available to students. The economic stability determines, in part, the extent to which employers can be regular participants in co-operative education. The availability of employer resources may be affected by the work of the school board, but it is mostly contingent on the problem solving adequacy of the department and the relationship established between the department and the employer.

Other external groups (Figure 2, S6) such as labour organizations, government employment agencies, the Ontario Secondary School Teachers Federation, the provincial Co-operative Education Association, and post-secondary institutions also impact on resource availability. Since students may be placed in unionized jobs, the support and cooperation of union organizations is essential to ensure that labour regulations are not violated and placements jeopardized. Employment and Immigration Canada provided funding in the past for the development of co-operative education to help reduce the numbers of school aged youth seeking job training and employment preparation. Personnel from this organization are also available as resources for schools. The Ontario Secondary School Teachers Federation has conducted descriptive research in co-operative education. In particular, this organization is concerned with the working conditions for co-operative education staff, the student-teacher ratio, and the tasks and responsibilities of teachers. The Ontario Co-operative Education Association facilitates the exchange of information throughout the province, encourages and supports research, and actively works to promote and expand co-operative education. As a result, the image of co-operative education is enhanced and more employers may seek out school-work partnerships. Successful collaboration with the external groups provides a great deal of informational resources which may improve co-operative education services for students.

In co-operative education, *school location*, urban or rural (Figure 2, S7), has implications for resource availability, problem solving activities, and organizational effectiveness. The type of job opportunities available for student placements in rural areas may be less diverse and impact on the ability of the co-operative education staff to meet student job interests. Given the nature of the rural setting, job placements may be inconvenient for students and teachers to access; thus, the location has implications for staff coordination of interviews, work schedules, and visitation of students on-the-job. However, employers in rural areas may be smaller and more receptive to students from the area, which may impact on the quality of the work placement and student satisfaction.

The next group of structure elements located across the bottom in the model includes five variables (Figure 2, S9 to S13). These variables are interrelated and impact in different ways on resource availability, problem solving, and organizational effectiveness. *School size* (Figure 2, S9), the population of the school, in part, determines certain *school structures* (Figure 2, S10). School structures define the roles, tasks, staffing patterns, and workload of staff members. However, the population of the school determines the number of people in positions of authority (e.g., principal, vice-principals, department heads), the diversity of course options, and staffing patterns for subject disciplines including co-operative education. Structures also serve to link the department with the school organization which facilitates *co-op-school relations* (Figure 2, S11). The relations between the department and the school may impact on the *resource availability* (Figure 2, S8), particularly when services and support are required from administration or other subject disciplines. In addition, elements of structure related to staffing arrangements are likely to impact on *co-op staff qualifications* (Figure 2, S12). Staff qualifications relate to training and years of experience in co-operative education. Teachers involved in co-operative education are expected to have additional qualifications (Part I, Part II, Specialist). It is recommended that co-operative education teacher monitors have at least Part I and co-operative education coordinators have their Specialist qualifications. Therefore, the amount of training varies among co-operative education teachers and coordinators. In some cases, years of experience in co-operative education may compensate for formal training. As a result, *co-op staff performance* (Figure 2, S13) may be affected by the amount of training and the number of years of experience in co-operative education. In turn, these impact on the problem solving ability of the department as they work to provide high quality care and service to students in co-operative education. How well the department performs has implications for organizational effectiveness.

The last group of structure elements include two variables related to size and maturity of co-operative education programs (Figure 2, S14 to S15). The volume of

students in the program as well as the number of staff assigned to work in co-operative education is *co-op program size* (Figure 2, S14). The size of the program has implications for problem solving and organizational effectiveness. In particular, large numbers of students require more jobs, therefore, more employer resources. The smaller the number of students involved, presumably, the higher the quality of care and service and the greater the social efficiency of staff. Small numbers, however, may not be economically efficient. Finally, the last element of structure is the variable *maturity of co-op program* (Figure 2, S15). Not all co-operative education programs began at the same time. Therefore, maturity, the number of years the program has been in operation, varies from school to school. Some schools have been delivering programs since the early 1970's while others are still experimenting. The older the program, the more likely that various aspects of the program have been refined to provide higher quality of care and service to students. As well, the older programs likely have a wider and more stable employer resource base.

Structure variables in the external environment, the school, and the co-operative education department may be interrelated and impact in different ways on both problem solving and organizational effectiveness. The next section is a more detailed discussion of the third part of the model, problem solving in the co-operative education department.

Problem Solving

Five problem-solving activities, *resource allocation, coordination, integration, strain*, and *adaptation*, are located in the centre of the model (Figure 2, Section PS, PS1 to PS5). According to Georgopoulos (1986), these five problem-solving activities are common to all systems, are interrelated, and may occur at different points in the system. The problem-solving activities are dynamic in nature. In addition, the adequacy of problem solving is determined, in part, by certain structures which either facilitate or hinder problem solving.

As a subsystem of the school, the co-operative education department may be faced with these problems at different points in the system cycle. For example, problems may arise when students begin the program, during their preparation for work, or at any time while they are working. The implementation and delivery of co-operative education, from the time the student enters to the point of exit, depend on a team effort. The ability of the department to secure sufficient resources, coordinate work tasks, meet and adapt to employer and community expectations, achieve integration within the school and co-operative education program, and function without tension as it provides high quality care and service to students is contingent on certain structures which promote and facilitate problem solving toward the achievement of organizational effectiveness.

Resource allocation. Georgopoulos (1986) feels the subsystem must be able to access and distribute a variety of human, information, and material resources in order to provide high quality, individualized patient care. Similarly, the co-operative education department must be able to access the resources it needs to provide group and individualized services to students. As noted earlier, *resource availability* has implications for the department's ability to solve problems related to *resource allocation* (Figure 2, PS1). Resource allocation includes the sufficiency of resources related to the number of teachers to administer and deliver co-operative education, employers to provide the job placements, support staff for guidance and secretarial work, funds for program expenses, information received from other parts of the school, and the physical space and facilities designated for co-operative education. But it also includes the level of satisfaction with services or support requested from guidance, administration, and other departments in the school. As well, it reflects the dependence of the department on both the external environment and the rest of the school organization. For example, human resources such as teachers, support staff, and employers are essential to the delivery of co-operative education. An abundance of employer resources means students have greater choice in their work placements. As well, it may mean that more students can be accepted into co-operative education. The ability of the department to secure various employer resources to accommodate individual student needs, to coordinate and monitor employer commitment to provide quality work experiences, to adapt to changing employer needs and expectations, and to maintain positive relations all impact on the effectiveness of co-operative education. Satisfaction in regard to the quality of work performed or service rendered may impact on the amount of strain experienced by those who work together and the degree to which participants feel committed to the program. Resources linked to facilities and equipment may facilitate the work. For example, adequate office space facilitates interviews with individual students, liaison with other teachers, and privacy in recruiting employers. Funds from the school may be required to purchase equipment and supplies, cover travel expenses of teachers who visit students, and reward students and employers for their participation. Therefore, sufficiency of resources and staff satisfaction with these resources impact on organizational effectiveness.

Coordination. According to Georgopoulos (1986), adequate coordination of work efforts to provide patient care is mostly achieved through flexible and spontaneous adjustments, informal cooperation, and good communication. Similarly, how well the co-operative education department links the activities of the staff so they converge toward the solution of work problems and the provision of high quality care and service to students is

coordination (Figure 2, PS2). The adequacy of coordination, however, is dependent on certain structures. The *qualifications* of the staff who do the work in co-operative education, experience, and amount of training, have implications for coordination. The *size of the program* in regard to number of teachers and students involved may also impact on coordination. Coordination is likely more complicated for larger programs. One might expect that the larger the number of students and teachers involved, the more difficult it is to coordinate all aspects of the program. In addition, the maturity of the program may also have implications for coordination. Coordination is likely more routine in a well established program. The adequacy of coordination also impacts on other problem solving activities. For example, the greater the adequacy of coordination, the more likely that needed resources (e.g., employers and information) are accessed and fairly distributed, strain is minimized among participants, commitment and integration of staff are high, and the department copes better with changing environmental forces. The ability of the department to successfully coordinate the work of different staff members and to accommodate students and their employers has implications for organizational effectiveness. The better coordinated the activities related to the student, the greater the educational efficiency of the system and the greater the student satisfaction. The better coordinated the activities related to the employer, the greater the social and economic efficiency. The better coordinated the activities related to the staff, the greater the educational and social efficiency.

Integration. According to Georgopoulos (1986), in order for staff to carry out the patient care activities in an effective and reliable manner, they must be committed and loyal to both the parent organization and the emergency unit as a subsystem. In co-operative education, the provision of high quality care and service to students depends to some extent on the *integration* (Figure 2, PS3) of staff members within the school and the co-operative education program. It includes their sense of appreciation for their work and their loyalty and commitment to the school and co-operative education program. The level of integration has implications for problem solving in other areas. If staff in the department feel their work efforts are appreciated by administration, then tension will likely be very low and coordination much easier because individuals cooperate. Furthermore, they are likely to promote co-operative education within the community which may increase available resources. As a result, good integration can certainly impact on staff satisfaction or social efficiency, which impact on educational and economic efficiency.

Strain. According to Georgopoulos (1986), it is essential to reduce the strain caused by structural deficiencies, poor planning, and communication in order to get co-operation from those who must work together to provide patient care. In co-operative education, many individuals, with different roles, must interact to provide high quality care and service to students. The amount of tension among those involved in co-operative education as well as among organizations which have a stake in co-operative education programs is *strain* (Figure 2, PS4). The total amount of strain within the department has implications for other problem solving activities. For example, tension among co-operative education staff members may lower commitment to tasks, such as visiting students at work. Tension among co-operative education staff and employers may interfere with the quality of students' work experiences and limit the availability of future employer resources. Tension with the school board or other external groups might interrupt the exchange of information. The amount of strain, therefore, has implications for organizational effectiveness. The lower the tension and strain among those involved in co-operative education, the greater the educational, social, and economic efficiency of the system.

Adaptation. For Georgopoulos (1986) adaptation assumes a continuous interaction with the environment. How well the co-operative education department meets community/employer expectations, engages in satisfactory relationships with interest groups, and collaborates with other schools and/or co-operative education departments for relevant services is *adaptation* (Figure 2, PS5). The adequacy of adaptation is determined by certain structures. The workload assigned to teachers may impact on the amount of time teachers have to spend interacting with employers. The less time, the less likely co-operative education teachers can respond adequately to employers needs. As well, the nature of student inputs may impact on adaptation. For example, students from basic level courses may need employers who are particularly sensitive to young people who have less academic ability. Therefore, staff must adapt recruitment strategies to target employers to meet various student abilities. *Maturity of the co-op program* has implications for adaptation as well. Relations established with employers over time likely improve communication between co-operative education staff and employers in regard to changing expectations or particular problems with students. The ability of the staff to solve problems of adaptation affects other problem solving activities and impacts on educational efficiency. In co-operative education, it is important to have knowledge of the employers in the community and their employment needs and expectations in order to identify and coordinate appropriate work placements for students. Positive relations with employers determine, in

part, the success of recruitment for valuable employer resources and the reputation of the program. Liaison and collaboration with other groups in the external environment can minimize the competition for employer resources, facilitate the exchange of information, and provide better services to students. Furthermore, positive relations facilitate the resolution of strain or tension which may develop between a student and an employer and impact on the quality of the work experience. Successful adaptation has implications for problem solving in other areas and is related to educational efficiency and student satisfaction.

Problem solving related to resource allocation, coordination, integration, strain, and adaptation is facilitated or hindered by various structures. These problems may occur at different points within the system cycle. All problem solving activities are interrelated in different ways. The adequacy of the department to solve the problems in one activity may impact on the success of solving problems in the other activities. Furthermore, the adequacy of solving has implications for organizational effectiveness. The greater the adequacy of the department to solve problems, the greater the organizational effectiveness.

In summary, the open-system organization shares many system properties and enduring problems as it interacts with its environment (Georgopoulos, 1986). The organization exchanges energy with the environment in order to achieve its objectives. Certain structures are established to facilitate the ability of the organization to achieve its objectives. In the same manner, the co-operative education department functions amidst certain structures which provide rules of conduct, standards of operation, and lines of communication and authority. The department accesses energy in the form of teachers, information, and employers to provide students with opportunities to integrate classroom studies with practical work experiences. The students are then provided with information and given skills from within the school environment and within the community. Many individuals share in this educational process and it requires a great deal of work, effort, cooperation, and collaboration among all participants to get the program organized and to provide high quality, individualized care and service.

From a system perspective, this model would appear very useful for understanding factors which facilitate or hinder organizational effectiveness in co-operative education. At this point, very little is known about the effectiveness of co-operative education. The next section is a brief overview of effectiveness of secondary school co-operative education related to outcomes, including relevant research on how learning outcomes are maximized.

Research in Secondary School Co-operative Education

In this section, the primary focus is on the research conducted at the secondary level. While more extensive research has been done in co-operative education at the post-secondary level, the relevance and application of the research to secondary school co-operative education is questionable. There are some major differences between these two levels of co-operative education which should be noted. Unlike the wide range of goals for co-operative education reported at the secondary level, Wilson (1985) determined from studies done by the Research Centre at Northeastern University that the single most important objective of post-secondary co-operative education in the United States and Canada is to facilitate career development. Students in co-operative education programs at the post-secondary level have made a commitment to a particular academic field and a career interest, whereas students in secondary school cooperative education are still in the exploration phase. Payment varies as well between levels. Students in post-secondary co-operative education receive financial remuneration in the form of a salary for their work, whereas students at the secondary level receive credits toward their graduation diploma requirements. The structure and intensity of the school-work schedule also varies between levels. In post-secondary co-operative education, students alternate four months of school with four months of work. In some cases, students may have an extended work term of eight months. In the secondary system, the most common arrangement is a schedule based on half a day at school and half a day at work for one semester. As a result, the frequency of interaction between the school and the student varies between levels. At the post-secondary level, students may have placements anywhere in Canada or in other countries. Interaction between the school and the student, therefore, is quite limited. At the secondary level, placements are local and interaction between the school and student is more frequent. Finally, expectations vary between levels. Participants in post-secondary co-operative education have greater expectations than participants in secondary co-operative education. Differences in students related to maturity, academic ability, and skill level affect school and employer expectations. These are just some of the differences which exist between levels of co-operative education.

This review includes first, a review of the goals established by school boards in Ontario for co-operative education. Second, in order to get a sense of what is happening in Canada, four comprehensive studies are presented. Third, the research done to assess specific student outcomes and benefits related to knowledge acquisition and achievement, retention, transition, and personal development is discussed. To a much lesser extent, some mention is made of employer outcomes and perceptions. Also, included in the

research on outcomes and benefits are some studies in which certain organizational factors were found to relate to outcomes of co-operative education. The final part of this section is a summary of the research in secondary school co-operative education.

Goals for Co-operative Education

Since most of the research on effectiveness of co-operative education is about outcomes and benefits, it is interesting to first consider the goals for secondary school co-operative education. Consistent with policies and procedures for co-operative education (Ministry of Education, 1989), many school boards in Ontario have specified goals which appeal to students from all levels of learning and with interests in a variety of disciplines. Four major boards of education representing a majority of secondary schools in the Ottawa-Carleton region identified goals of co-operative education. These goals suggest that students should have opportunities to 1) clarify occupational objectives, 2) develop self-esteem and interpersonal skills, 3) practice with modern technology, 4) acquire employability skills, 5) learn from a skilled role model, 6) earn credits towards a diploma, 7) increase interest in related studies, 8) learn to cope with changes and stress, 9) determine requirements to enter a particular occupation, 10) practice decision-making skills, and 11) assess employment opportunities (Ottawa-Carleton Secondary Schools, 1987).

More general goals for students participating in co-operative education were classified by the Wellington County Board of Education (1984) under four areas: growth and maturity, career awareness and decision-making, awareness of community and labour market demands, and skill development through extension of classroom theory. These goals are also consistent with those determined by Dhanota, Wright, and Toplak (1980) who surveyed secondary school students, teachers, and advisory committee members involved in work-related programs in the Toronto area. They concluded that goals for co-operative education include 1) exposure to the world of work, 2) the application and reinforcement of classroom knowledge, 3) the acquisition of employability skills, 4) the development of interpersonal and decision-making skills, 5) the clarification of career objectives, and 6) the opportunity for employment.

An awareness of the goals of co-operative education is useful as one reviews the literature related to secondary school co-operative education.

Comprehensive Canadian Studies

The first comprehensive study of secondary school co-operative education in the province of Ontario was conducted by Hughes and King (1982). This study was initiated

because of increased public support for schools to prepare students for the workplace, the steady increase in co-operative education programming, and the lack of direction and support for secondary school co-operative educators. The purposes of the study were to determine the characteristics of the participants involved in co-operative education, the nature of the existing programs, and the factors which facilitated or hindered the development of co-operative education. The study was based on statistics from the Ontario Secondary School Teachers Federation annual survey conducted in 1981, an overview of co-operative education in 16 public school boards, and in-depth case studies with co-operative education participants from 13 schools in six boards of education in Ontario. Participants interviewed in the case studies included 15 administrators, 192 students, 44 teachers, and 98 employers.

Based upon the statistics, 72 percent of the school boards in Ontario were involved in co-operative education. At this time, 6,322 students from 298 schools were participating in co-operative education programs. This represented only one percent of the total student enrolment in Ontario secondary schools. Hughes and King (1982) reported that small school boards, with less than 500 students, were not likely to be involved in co-operative education.

Based upon the data collected from the 16 school boards, Hughes and King (1982) found the majority of students were in grade 12. Students were registered in a variety of related co-operative education courses; however, the largest percentages were found in business (38%) and technical (20%) subjects.

As a result of the in-depth interviews, Hughes and King (1982) reported that 68 percent were taking their math, English, and science courses at the general level, 17 percent were in basic level courses, and 15 percent in advanced level courses. In addition, the majority of students from all levels of study had already acquired a minimum of 20 academic credits prior to their participation in co-operative education. The researchers felt students in co-operative education were likely to complete their graduation requirements. The majority of students were enthusiastic about co-operative education and considered it valuable for career search and job preparation. However, students reported very little actual skill development and exposure to modern technology on the job. In regard to benefits, the majority of students reported gains in self-confidence as well as more positive attitudes toward school and work. From the students interviewed about their destination after graduation, half expressed an interest in some form of post-secondary education and half indicated an interest in employment.

As well, they found that teachers in general were also extremely enthusiastic and supportive of co-operative education as a mode of learning. The nature of their involvement

in co-operative education was varied. The largest percentage of teachers, 66 percent, was responsible for teaching the in-school component as well as monitoring students on-the-job. Twenty percent were teaching the in-school component and 14 percent were involved in monitoring students at the worksite. Many teachers preferred to work with groups of co-operative education students during the in-school component. As well, they felt that blocks of work time, as opposed to half days or alternate days, were more conducive to the teacher-employer relationship. The greatest dissatisfactions with co-operative education reported by the teachers included the lack of adequate time to monitor students at work and the under-use of guidance counsellors.

Furthermore, they reported that the type of employers involved in co-operative education varied. Approximately 21 percent represented retail outlets, 20 percent educational institutions, 13 percent government agencies, 9 percent manufacturing/shops, 8 percent non-profit organizations, and smaller percentages in hospitals, hotels, banks, radio stations, and beauty salons. A total of 26 percent of the organizations were unionized. The majority had less than 50 employees. The majority of employers reported that the school was not involved in deciding the type of work to be done by the students on-the-job. Employers rated students on various performance criteria as average to above average. Despite the time and energy invested in training students, the majority of employers felt that student performance was economically beneficial to their organizations.

Based upon the results of the research, Hughes and King (1982) recommended that co-operative education serve a wider range of students including low achieving, high-risk, poorly motivated, and adult students returning to school. As well, they felt guidance counsellors could play a major role in providing more appropriate career information and easing the transition from school to work.

Concerns about the effectiveness of co-operative education at the school level prompted the Wellington County Board of Education (1984) to develop and test a Program Implementation and Evaluation Profile to document the status of a particular co-operative education program. Based on the goals developed by the board, a study was conducted to determine 1) teacher perceptions of the level of implementation and identifiable obstacles, and 2) perceptions of co-operative education graduates.

In regard to the level of implementation, 30 co-operative education teachers within the board were interviewed to determine their perceptions of six dimensions of co-operative education programs, each with various sub-dimensions. Responses ranged from Level 1 (lack of knowledge) to Level 4 (effective use). The dimensions and sub-dimensions included:

- 1) *administrative practices* (student selection and employer selection, student placement, communication procedures, program/course development, public relations, and budget)
- 2) *program objectives* (knowledge, planning, core skills, and integration)
- 3) *communication activities* (objectives, counselling, consulting, student progress)
- 4) *methodology of classroom activities* (variety, resources, flexibility, interaction)
- 5) *supervision activities* (worksite, student visitation reporting, monitoring and evaluating reporting)
- 6) *evaluation methods* (student, worksite, course, teacher/self)

Results indicated that the majority of teachers rated the implementation of the above dimensions at Level 3 or Level 4. A breakdown of results by sub-dimension indicated that lower levels of implementation under *administration* were reported for communication procedures and public relations. For *program objectives*, lower levels were reported for core skills for pre-employment preparation. Of particular interest were the results for *communication*. For the school board, the sub-dimensions of counselling and consulting were considered the most important for the success of the co-operative education program. Consulting received a high rating from teachers, but counselling, communication of objectives, and student progress were rated lower. For classroom *methodology*, interaction of students in class was rated the highest, while variety, flexibility, and resources were equally lower. The level of implementation for all sub-dimensions of *supervision* was very high. Finally, for *evaluation*, teachers perceived their programs most effective in regard to student and work site evaluation.

In regard to obstacles hindering effective implementation of co-operative education, many teachers reported the following problems.

1. The workload did not provide sufficient time to travel to the student's worksite, to develop employer resources, facilitate good public relations, and to write reports. This was particularly noticeable in small schools and in schools with out-of-town placements.
2. Internal public relations strategies were needed to improve effectiveness and awareness of co-operative education and with non co-operative education teachers and staff.
3. Students had concerns about transportation to their jobs and the associated costs.

4. Smaller schools had limited flexibility for scheduling co-operative education, fewer timetable options, and a reduced employer base for job opportunities.
5. Student selection for co-operative education was limited by student involvement in part time jobs, extra-curricular activities, and teacher attitudes.
6. Employer selection was limited by attitudes toward young people and reluctance to release students for class integration activities.
7. Standardized procedures were felt to be needed in regard to student evaluation.

Student perceptions of their co-operative education experiences were obtained from 173 co-operative education graduates from five high schools (Wellington County Board of Education, 1984). The majority of students felt that co-operative education had a positive impact on their attitudes toward school and work. Ninety-seven percent said they had profited from their co-operative education experience and 99 percent said they would recommend co-operative education to a friend or a relative. The most valuable learning experience reported by the majority of students was exploring a particular career interest, but other benefits included personal and interpersonal skill development. For those students who felt that co-operative education did not meet their needs, concerns were expressed about jobs which were not relevant to student interests or school courses, jobs with limited variety and responsibility, and insufficient worksite visits. It was particularly interesting that 100 percent of the students surveyed had attended or were attending some form of post-secondary education at the time of the survey. From this total, 40 percent felt that participation in co-operative education had assisted in their acceptance at the post-secondary level.

Based on the recommendations from an internal review of co-operative education in 1981-82 in the Scarborough Board of Education, Cheng (1990) conducted a study with 534 senior co-operative education students from 23 schools in the Scarborough Board of Education. The purpose of the study was to provide information on the characteristics of students taking co-operative education and their perceptions about various aspects of the program. Based on data collected related to background information of students, Cheng (1990) reported that the majority of students were female (67%), between the ages of 17 to 19 (90%), taking advanced level courses (54%), averaging above 70 percent (58%), taking co-operative education for the first time (90%), and working part-time (74%). Relevant to socio-economic background (SEB), 17 percent of the students were from high-SEB, 42 percent from medium-SEB, and 29 percent from low-SEB. Twelve percent of the students did not respond to this question. He also reported that the majority of students were taking co-operative education to 1) help decide a future career, 2) help decide future education,

3) learn job skills, 4) get practical experience, 5) learn to be successful at work, and 6) obtain a job reference. Student reasons for taking co-operative education were consistent with goals for co-operative education. As well, over 40 percent of the placements were in business offices and schools. In addition, he expressed concern that placement of males in trade areas and placement of females in schools, hospitals, and day care centres may reflect a gender bias. Related to outcomes of the program, Cheng (1990) indicated that a large percentage of students were uncertain about the relevance of their academic work to the work experience and vice versa, but that the majority of students (86%) would recommend co-operative education to others.

Thibault (1991) conducted a study to determine characteristics of students involved in co-operative education, their perceptions of the school's performance in the administration and delivery of co-operative education, program outcomes, and areas of improvement. She surveyed 200 senior co-operative education students from ten secondary schools in two British Columbia school districts. Similar to Cheng (1990), Thibault (1991) reported the majority of students were female (65%), between the ages of 17 to 19 (80%), in grade 12 (55%), and averaging marks greater than 72 percent (69%). When asked about factors that affect participation in co-operative education, the majority of students indicated that they were highly motivated to participate in co-operative education (66%) and, apart from themselves, were most likely to be influenced by teachers, family members, and friends. For the majority of students, the most important reasons why they participate in co-operative education were to 1) explore a career interest, 2) help make decisions about college/university education, and 3) obtain work experience for a future job. The nature of the work performed by students varied. Twenty-seven percent were in business as secretaries, accountants, computer programmers, and management assistants, 22 percent were in service positions as hospital aids, teacher aids, day care attendants, 17 percent in science labs, 14 percent in technical positions related to drafting, computers, aviation, engineering, and television, 8 percent in creative arts as graphics artists, interior designers, photographers, and reporters, and 6 percent in recreation and physical education as activity aids and physiotherapists. Not all students provided sufficient information to classify their work. Overall, student perceptions about the school's performance in all areas of co-operative education (counselling, related subject, preparation for work, the work placement, monitoring on-the-job, integration and evaluation activities) were generally positive. Based on a scale from one to ten (poor to excellent), 46 percent of the students rated the schools' performance 8 or higher, 26 percent gave ratings between 5 and 7, and 26 percent gave ratings 4 or lower. Related to outcomes, the majority of students reported that their overall achievement increased from the time of their initial application to

co-operative education to a period near the completion of the program. The general high achievement of students was reflected by the plans of 68 percent of the students to continue their post-secondary education after graduation. Other outcomes and benefits reported by many students included knowledge of the job, work experience, confirmation of career interest, personal growth, and employment offers. A large majority of students, 76 percent, said they would recommend co-operative education to a friend. Finally, 76 percent of the students suggested areas for improvement. In order of importance, three main areas of concern were identified, program organization, teacher attitudes, and the work placement. Transportation was not a problem for the majority of students. Of particular interest to the researcher, was that for all three areas the large majority of changes recommended were directly within control of the school.

The above studies have provided information on a number of aspects of co-operative education. Effectiveness of co-operative education is most often judged according to the outcomes or benefits received by participants in co-operative education. Primarily, the research is directed toward outcomes and benefits which accrue to students, the prime beneficiaries in secondary school co-operative education. Various outcomes have been documented in the above studies for students. Gains were noted in self confidence, interpersonal skills, attitudes toward school and work, knowledge about jobs, confirmation of career interests, employment opportunities, and higher achievement. For the most part, students would highly recommend co-operative education to a friend. For employers, it appears that participation in co-operative education is satisfying and that students contribute to the productivity of the organization. Other researchers have added more information about specific outcomes for students and the factors which impact on the effectiveness of co-operative education. While the partnership with employers is essential to the survival and success of co-operative education, very little research has been directed toward employer outcomes or benefits. Likewise, little is known about the outcomes for schools which participate in co-operative education. More specific information is outlined below relevant to selected outcomes and factors which may facilitate or hinder the success of co-operative education.

Outcomes and Benefits of Co-operative Education

There is evidence to suggest that participation in co-operative education leads to outcomes which improve school attendance, academic performance, and relevancy. Lally (1990) surveyed 85 secondary school female students taking family studies (course subject) to determine whether participation in co-operative education affects academic achievement in the course subject, perceptions of relevancy of the course subject, and days

in attendance. She compared students who selected co-operative education to those who did not select co-operative education on the above factors prior to participation in co-operative education and following the completion of the program. In the pretest, students who selected co-operative education attended fewer days of school and had lower academic achievement than students who did not select co-operative education. Posttest results indicated no change in attendance patterns, but students in co-operative education had higher academic achievement in the subject course and more positive perceptions of subject relevance.

Some researchers have expressed concerns that schools select their best students to participate in co-operative education programs which may account for higher retention rates and achievement levels. Thibault (1991) reported small numbers of students at the lower achievement range and indicated that possible reasons for this might include limited program size, a selection process which appears to favour good students, and limited availability of programs in early grades for high-risk students. Cheng (1990) reported a large percentage of the co-operative education students surveyed were in advanced level courses and achieving high marks. Cheng questioned the criteria used for selection and the tendency to encourage good students into co-operative education. He pointed out however, that based on enrolment statistics from the Scarborough Board of Education, students in basic and general level courses were still more likely to take co-operative education.

Cooperative education has also received attention from researchers interested in factors related to the transition process of students from school to work. Donaldson (1989) surveyed 26 high school drop-outs and 33 graduates from the same school, one year after they had been out of the school system, to investigate the aspects of their educational experience which were most useful in their search for employment. Donaldson clarified that at the time of her study co-operative education was a recent innovation and only four of the students she surveyed had selected co-operative education as an option. Eight others had considered co-operative education but changed their minds for various reasons including failure to meet academic requirements, interference with the selection of other course options, and involvement in extracurricular activities. It was not reported whether these eight students represented the drop-outs or graduates. She determined that co-operative education did not seem as important as part-time work experiences for those students making the transition from school to work. She noted, however, that these part-time experiences did not facilitate career development. Donaldson recommended that successful transition programs must meet the needs of all students, in particular, students with different levels of achievement. Given the increase in participation in co-operative

education since the time of her study, Donaldson (1989) felt co-operative education would impact more positively on future studies of the transition process.

In a later study, Taylor, Boss, Bedard, Thibault, and Evans (1990) investigated variables which influence the transition of students from school to work. They surveyed students from nine educational settings in Ontario, including students in the Futures Program, traditional high school programs, and co-operative education programs. The four variables they investigated included attitudes toward training for new technology, economic locus of control, self-efficacy, and self-estrangement. Surprisingly, no differences were found for any of the four variables which could be related to participation in co-operative education.

Outcomes related to personal development are commonly reported in the literature. Shaugnessy (1986) administered the Personal Skills Map (PSM) to co-operative education and non co-operative education students from two secondary schools in Ontario. The PSM is a self assessment of intrapersonal, interpersonal, career, and life management skills. It includes a total of 14 scales. The *intrapersonal dimension* includes scales for self esteem, motivation, and change orientation. The *interpersonal dimension* includes scales for assertion, aggression, deference, awareness, and empathy. The *career/life management dimensions* include scales for drive strength, decision-making, time management, sales orientation, commitment ethic, and stress management. The survey included one non-semestered school and involved 51 students (27 co-op and 24 non-co-op). The other school was semestered and included 45 students (22 co-op and 23 non-co-op). In the pretest, Shaugnessy reported that co-operative education students on the average scored higher than non-co-operative education students for all skill areas. Posttest, she reported that changes in personal skills were greater overall for co-operative education students. The areas which showed the greatest improvement for co-operative education students included assertion, commitment ethic, interpersonal comfort, self esteem, and sales orientation. On the other hand, the control group declined in all skill areas except one, interpersonal comfort. Gains in skills were also greater for co-operative education students in the semestered school. As a result, Shaugnessy felt the semestered system was likely more beneficial for the co-operative education student because of the intensity of work time in a shorter period. She felt the PSM could be used to improve the match between student and employer and for curriculum development related to specific areas of weakness. She recommended future research with larger samples and more variables.

As a follow up, Stresman (1986) used the PSM to compare personal skills changes among senior and adult business students in co-operative education and regular programs from one high school. She administered a pretest and posttest of the PSM to 10 senior

students and 5 adult students in the co-operative education program and to 8 senior students and 6 adult students in the regular program. The results of her study indicated that senior students involved in co-operative education had higher levels of self esteem, empathy, drive strength, decision-making, time-management skills, and commitment ethic than senior students from the regular program. Adults who participated in co-operative education programs had more drive strength and interpersonal comfort than adults in regular programs. While the gains appear to be greater for senior students involved in co-operative education programs, the researcher expressed that adult students may have acquired a certain level of personal skills from previous exposure in the adult world. She recommended that objectives be appropriate for the maturity of the students participating in co-operative education and that teachers be trained in affective skill development to maximize the personal skills benefits for students.

Some efforts have also been made to understand the effectiveness of co-operative education in regard to organizational factors which affect the outcomes. Germscheid (1980) investigated program effectiveness and organization in 26 Alberta high schools involved in work experience education. He surveyed key participants (93 students, 23 coordinators, and 74 supervisors) to determine 1) the extent of agreement among participants on learning outcome priorities and attainment, and 2) transactions or linkage dimensions which contribute to program effectiveness. Learning outcomes were classified by cognitive and affective learning domains (as described by Krathwohl, 1973). Cognitive objectives included thinking, knowing, and problem solving. Affective objectives included attitudes, values, interests, and appreciation. Linkage dimensions included *formalization* of sanctions and activities, *intensity* of school-employer interaction and resource commitment, *reciprocity* of resource exchange, and *integration* of school and work experiences. Germscheid (1980) noted that Canadian secondary school students, teachers, and supervisors perceived benefits from work experience to be highest in the affective category. As well, the majority of anticipated outcomes and actual outcomes were found to be in the affective domain. In general, programs were characterized by moderate levels of formalization and reciprocity and low levels of intensity and program integration. All linkage dimensions were found to contribute in a positive way to priorities and perceptions of benefits. As a result, Germscheid (1980) recommended more involvement by school and employer in each others domain, clearer specification of participant expectations, increased resource commitment, and more frequent interaction among school, student, and employer/supervisor.

An interesting qualitative case study conducted by Wodlinger (1990), with 14 tenth grade high school students and two teachers in British Columbia, has provided some

insights into program structures, teaching strategies, and student and teacher experiences that facilitate the effective integration of an academic area with cooperative education. Results of his study suggest that the related subject be taken concurrently with the work experience to maximize integration opportunities. As well, he noted that integration efforts are more effective when the curriculum of the related subject is similar to the workplace activities. For teachers, careful planning, clear expectations, and flexibility reduce student perceptions of ambiguity and risk and facilitate more effective integration between workplace and classroom experiences. However, large class size hinders the integration effort. Integration is more effective and cooperation greater when students are involved in decision-making, but extra assignments and activities to increase integration may interfere with other academic activities and attendance at school. Integration as a linkage between education and work was also considered by Germscheid (1980). He recommended that schools should increase their contribution to program integration through more instruction of students at the work site, more discussion of problems emerging from job experiences, and more exposure to job expectations.

Owens and Owen (1981-82) investigated differences between high and low learning sites and their relationship to certain job factors. They identified a number of factors based on social learning theory which they felt would impact on the quality of student learning at the workplace. The various job factors included 1) hands on activities, 2) task difficulty and challenge, 3) responsibility, 4) content of learning, and 5) relationship with adults at the sites. They surveyed 1,103 high school students enrolled in 18 experience-based career education programs from 16 states in regard to their perceptions of the workplace. Results indicated that students in high learning sites were more involved in hands-on activities and had more challenging job tasks and greater responsibility. In regard to interaction with adults, students in high learning sites had more positive relationships, more frequent interaction, and more people interacting with them than at low learning sites.

There is not a great deal known about how employers feel about co-operative education. The general sense is that they are supportive and enthusiastic. Some limited information is available in regard to the nature of the workplace and the implications for co-operative education. Smitas (1984) interviewed employers and employees from 45 secondary school co-operative education business worksites to determine whether particular worksites were more effective than others in providing quality co-operative education experiences. Worksites were classified as either small businesses, large businesses, or government agencies/non-profit organizations. Based on employer and employee perspectives, Smitas found that size was an important structural and

environmental factor. Size of the worksite appeared to account for different perceptions of the training co-operative education students received, the nature of their daily routine, and the frequency of interaction with employers and employees. However, Smitas noted that each worksite, regardless of size, seemed to provide unique learning environments for different co-operative education students. As a result, she felt that it was more important to match students according to their needs, abilities, and personalities to appropriate workplaces. Certain students may benefit more from larger businesses than smaller businesses and vice versa.

Earlier Winer and Kane (1983) also provided some interesting information. They investigated perceptions of 241 employers from the state of New Jersey in regard to the strengths and weaknesses of secondary school co-operative education. Information was collected on six factors including functional skills of students, administrative concerns, recruitment, skill development, personnel policies, and academic improvement. The majority of employers expressed general satisfaction with school programs and students' functional skills. Employers felt the most important things to be considered when taking students into their organizations included student motivation, human relations skills, and good work attitudes and habits. In regard to benefits of participation, the majority of employers felt that co-operative education was an excellent tool for recruitment. Areas of concern for employers had to do with procedural matters and administrative details (student supervision, referral, selection, scheduling).

Summary

Based on the goals identified for co-operative education, programs are designed to prepare students for transition to the world of work as well as for future educational endeavors.

Researchers have identified certain characteristics of students participating in co-operative education. For the most part, students get involved to explore a career interest, but they also hope co-operative education will assist them in making educational decisions and give them some valuable work experience. Students in co-operative education appear to be senior students who are likely to complete their graduation requirements. The participation of high achieving students in co-operative education programs may explain why goals related to finding a job, staying in school, getting along better with people, or getting into apprenticeship programs are less important. The early research provided evidence of large numbers of general level students in co-operative education, but recently it seems that more advanced students are getting involved. If co-operative education is to help students in their transition from school to work, then it would appear that the students

who could benefit most are not participating to the extent one would hope. This pattern may also reflect employer perceptions that high motivation, positive attitudes, and good human relations skills are the most important characteristics of co-operative education students. It also appears that more females are involved in co-operative education than males. Job placements vary considerably, but there is a sense that some traditional patterns may exist in regard to gender.

Participation in co-operative education does appear to enhance certain learning outcomes and benefits consistent with the goals. It seems, that benefits for students are mostly in the affective domain. Students have reported gains in all areas of intrapersonal, interpersonal, career, and life management skill development. They have also indicated, to some extent, improved attitudes toward school and work. Not only do they feel co-operative education has allowed them to explore careers, but it has helped them understand the realities of the workplace and the value of staying in school. In some cases, students feel their school studies are more meaningful as a result of their participation in co-operative education. While there is limited evidence on improved academic performance, it does appear that participation in co-operative education does not jeopardize academic performance.

There is also some limited information about certain school and job factors which seem to impact on the quality of students' co-operative education experiences. It appears that linkage dimensions between the school and employer affect perceptions of participants about the benefits. In particular, the greater the formalization of tasks and activities, the intensity of the interaction and resource commitment, the mutual exchange of resources, and the integration of school and work, the more likely participants are to express positive perceptions of the benefits. It has been suggested that more effective integration of students' classroom knowledge and work experiences appears to occur when the related subject is similar in content to the actual job and taken at the same time as the work experience.

Factors relevant to the job also impact on the outcomes of the program. In high learning workplaces, students are more involved in hands-on activities, greater responsibility, and more challenging tasks. In addition, students are likely to be more satisfied when co-operative education meets their needs. It appears, that employers prefer students who are highly motivated and possess good human relations skills and work habits; however, most still benefit from the quality and quantity of students' work. The size of the organization or workplace may impact on co-operative education students in different ways; therefore, co-operative education staff need to consider the type of workplace which is most appropriate for a particular student.

Despite the general overall satisfaction with co-operative education, a number of obstacles were identified that appear to impact on effective implementation and outcomes of co-operative education. Some of these related to workload of co-operative education staff, relations within the school, student selection, employer recruitment, transportation, and school size.

In general, the literature on secondary school co-operative education includes a number of empirical studies that are mostly descriptive in nature. They provide information related to goals and objectives of co-operative education, benefits for participants, and organizational factors (program structure, participant characteristics, and internal processes) that impact on the outcomes of co-operative education. Some researchers compared differences between co-operative education students and students who have not participated in co-operative education. Some researchers investigated the impact of participation in co-operative education on the transition process from school to work. The research in co-operative education provides some interesting information; however, most of what is known includes only isolated pieces based on co-operative education programs in place. 1) The research has been mostly descriptive. It is not known if any of the relationships are casual since variables were not manipulated. Caution should be exercised in regard to the research validity. For the most part, the research has not been guided by any sort of comprehensive or theoretical framework. As a result, one has not been able to assess the full scope of co-operative education. Much more explanatory research is needed in order to enhance one's knowledge of co-operative education.

Statement of the Problem

It appears that co-operative education experiences are generally positive for most participants and that various factors impact on the success of co-operative education. Researchers have documented many benefits for students. There is a sense at times that certain characteristics of students and teachers may impact on the outcomes, that various aspects of how the program is structured may facilitate or hinder the outcomes, and that processes related to implementing co-operative education may affect outcomes. While some researchers have conducted quite comprehensive studies, including a number of variables, they have mostly described co-operative education without explaining how variables relate to one another. Other researchers have tried to explain some outcomes in terms of their relationship to certain school, program, and job factors; again, their approach has been mostly fragmented and narrow. In general, there is evidence to suggest a lack of consistency and standardized measures, a reliance on outcome measures, and avoidance of

internal process variables related to the problem solving adequacy of those individuals who work together to administer and deliver co-operative education.

After a review of the research, it appears that there is a need for a theoretical framework and a different way of thinking about co-operative education in order to truly understand the relationships among the various components of co-operative education. A more comprehensive framework is needed at this time. Studies based on an open-system perspective may provide a suitable approach for understanding organizational effectiveness in secondary school co-operative education. In particular, the model of organizational effectiveness (Georgopoulos, 1986) which was discussed above, appears to have considerable relevance for research in secondary school co-operative education. This model can be used to create a total picture of the many related variables or elements of co-operative education and their relationships to organizational effectiveness of co-operative education as a subsystem.

Therefore, the main purpose of this study is to test the Model of Organizational Effectiveness Adapted for Co-operative Education (adapted from Georgopoulos, 1986), in order to determine if it is useful in the assessment of relationships among variables identified in secondary school co-operative education.

In the following chapter, the research methods are described.

CHAPTER III

RESEARCH METHODS

This chapter describes the research design and methodology in five sections. The first section is a discussion of the variables selected for use in this study. In the second section, the relationships among variables to be tested are presented. This is followed by a description of the research instruments. The fourth section includes the research sample and data collection methods. Procedures for data analysis are described in the final section.

Variable Selection

The assessment of organizational effectiveness is extremely complex and involves many variables related to the external and internal environment including structure, inputs, through-puts, and outcomes. For this study, there were many reasons to limit the number of variables included in the original model (Georgopoulos, 1986).

First, since the study was being carried out in Ontario, some variables were not used because they were common to all school boards, schools, and programs in Ontario. Second, since it was imperative to guarantee anonymity of responses, this placed limitations on the collection of data and the assessment of certain relationships. For example, without assurances of anonymity, it is unlikely that certain individuals or groups would have consented to participate. Anonymity was also essential because the nature of the data collected had the potential to hinder participant responses, strain relationships among participants, and interfere with future research efforts. Third, it was important to consider the workload of teachers and employers involved in co-operative education and the time commitment needed to conduct an extensive study. Fourth, a test of the complete model, while challenging and highly desirable, was not possible without additional human and financial resources. A single researcher could not possibly replicate the magnitude of the original study by Georgopoulos et al (1980) which was conducted over a four year period and involved a substantial research grant, a team of researchers, and the development of multiple instruments. In addition, it included both quantitative and qualitative data, and the assessment of organizational effectiveness from seven perspectives, both internal and external to the organization. In keeping with the limited resources, the researcher for this study relied on quantitative data and perspectives from students and teachers. This furthermore, reduced the number of variables which could be adequately tested. It should be noted that there was no reduction in the number of variables

for problem solving, but there was a reduction in the number of variables used to assess organizational effectiveness and structure.

Following, is a description of the variables selected for this study.

Organizational Effectiveness

In the Model of Organizational Effectiveness Adapted for Co-operative Education there are three outcomes of organizational effectiveness (see Figure 2). The primary outcome is educational efficiency. Two secondary outcomes include achievement, and student satisfaction.

Educational Efficiency

For this study, educational efficiency, which was equated with Georgopoulos' (1986) clinical efficiency, was included as one of the main outcomes of organizational effectiveness. Clinical efficiency, or the quality of care as perceived by patients and staff, was the heart of Georgopoulos' study. In this case, student perceptions of how well they were cared for and serviced in co-operative education by the school were considered because students are the prime beneficiaries. In secondary school co-operative education, the nature of the program and the activities and tasks required to deliver co-operative education are based on standardized policies and procedures established by the Ontario Ministry of Education (1989). Expected outcomes for seven major program components were identified from these policies and procedures to allow individual students to assess educational efficiency or the quality of care/service they received from the school. The components of educational efficiency and their operational definitions are presented below:

Counselling for co-operative education (COUN). This is the extent students perceived they had a thorough understanding of their responsibilities, implications for academic study, and the potential of co-operative education to meet their educational, personal, and career needs.

Related subject consonance (SUB). Consonance in the related subject refers to the extent students perceived that the in-school academic components or subjects were compatible with their out-of-school work experiences.

Preparation for work (PREP). This is the extent students perceived they had adequate information to assess career interests and abilities and received appropriate work-related information necessary for entry into the work environment.

Work placement consonance (JOB). This refers to the extent students perceived their co-operative education jobs were compatible with their interests, abilities, and skill levels.

Monitoring (VISIT). This is the extent students perceived they were visited at the workplace by a supportive teacher-monitor, knowledgeable in the career area, and committed to making sure they were involved in meaningful work experiences.

Integration (CLASS). This is the extent students perceived they had sufficient opportunities to meet on a regular basis in class with other co-operative education students, to share work place concerns and to reflect and analyze their work experiences from a broad perspective.

Evaluation (EVAL). This refers to the extent students perceived they were involved in a constructive and on-going assessment of their progress while involved in co-operative education.

The quality of care/service that students receive from the school while they are in co-operative education has implications for two secondary outcomes, achievement and student satisfaction.

Achievement

Achievement (POST-ACH) *was* included as a secondary outcome of organizational effectiveness. Since there is some evidence from the literature to suggest that participation in co-operative education impacts on achievement, it would seem that the student perceptions of educational efficiency and student satisfaction would relate to the overall average marks attained by the student near the end of the school year.

Student Satisfaction

For this study student satisfaction *was* included as a secondary outcome of organizational effectiveness. Satisfaction was assessed using a variety of measures. Of particular interest was how students felt about the *overall quality of service* for each of the seven components of co-operative education identified in educational efficiency (SCOUN,

SSUB, SPREP, SJOB, SVISIT, SCLASS, SEVAL). Since students take co-operative education for different reasons, it was also of interest to verify how well the program *met student needs* (SNEED), the extent to which students felt they *benefitted from participation* in co-operative education (SBEN), whether they would *recommend co-op to a friend* (STELL), and finally perceptions of the *overall rating of the quality of care* students received from the school (SQC).

Structure

Nature of Student Inputs

Characteristics of students in regard to their achievement, level of study, motivation to participate, part-time work experiences, and volunteer work experiences were identified as 'student inputs' and *were* selected in this study. These inputs were thought to impact on educational efficiency and student satisfaction, as well as to impact on the problem solving adequacy of the teachers who deliver co-operative education programs. A discussion of each of these student inputs follows:

Achievement. The Ministry of Education advocates that all students have access to co-operative education programs. Several researchers expressed concern that more high achieving students are applying for co-operative education than low achieving students (Cheng, 1990; Thibault, 1991). In order to get a sense of the range of achievement for students participating in co-operative education and how it impacts on the problem solving adequacy of the staff and the three outcomes of organizational effectiveness, it was important to obtain the overall average marks (PRE-ACH) of students prior to their participation in co-operative education.

Level of study. Information on achievement, however, is more clearly understood in terms of the level of study (LEVEL). In Ontario, students select courses from a number of levels of study (basic, general, and advanced) with possible implications for future education. In general, it is expected that students taking courses at the basic level are preparing for the labour market; students taking general courses are equipping themselves for college; students taking advanced level courses are preparing for university. Since the level of study in course work may be useful information to consider in the administration and delivery of co-operative education, it was felt that this variable might impact on the problem solving activities of co-operative education educators and help explain differences in student perceptions of educational efficiency and student satisfaction.

Motivation to participate. Motivation in this study included the reasons (REAS) why students participate in co-operative education and the degree of their motivation (MOT). There are many reasons why students get involved in co-operative education programs. Some may be exploring a career interest or starting an apprenticeship program, some may be wishing to make educational decisions, and others may wish an edge in a competitive job market. To a lesser extent, some may be hoping to earn a few easy credits or get a needed break from school. Since the possibility of participation in co-operative education is open to all students, it is likely that the degree of motivation will also vary. From the literature it appears that employers feel motivation is an important student characteristic (Winer & Kane, 1983). Both REAS and MOT have the potential to influence the problem solving adequacy of the teachers in the co-operative education department and to impact on the outcomes of the program (educational efficiency, achievement, student satisfaction)

Part-time work experiences and volunteer work experiences. In this study, these variables are used to determine the extent of involvement of co-operative education students in part-time (PART) and volunteer (VOL) work experiences. Based on earlier research, it was determined that one of the main reasons students take co-operative education is to gain some valuable work experience (Cheng, 1990; Thibault, 1991). One would expect therefore, that certain co-operative education students may not be familiar with the work environment. However, Donaldson (1992) reported that most high school students are involved in part-time work experiences. These students may react quite differently to co-operative education because of their previous knowledge of the workplace. As a result, the extent of involvement in part-time work experiences and volunteer work experiences was considered to impact on problem solving and outcomes of the program, namely educational efficiency, achievement, and student satisfaction.

School Location

School location (LOC) was included in this study. Co-operative education exists in schools in both rural and urban areas. Where the school is located was expected to have a number of implications for co-operative education. In regard to the problem solving adequacy of the co-operative education staff, for example, it was felt that location could impact on the availability and recruitment of suitable employer resources with diverse work placement opportunities. Furthermore, it was also expected that location of the school may impact on educational efficiency, achievement, and student satisfaction.

School Size

School size (SIZE) *was* included in this study. As mentioned earlier, the number of students in the school determines the number of available teachers, the diversity of course options, and the availability of certain resources (Wellington County Board of Education, 1984). School size was expected to relate to problem solving adequacy of the co-operative education staff and to the outcomes of educational efficiency, achievement, and student satisfaction.

Co-op Program Size

Co-operative education program size related to the number of students (STUD) and the number of teachers (TEACH) involved *was* considered a factor in this study. Since co-operative education programs vary from school to school, the size of the program based on these two variables was expected to impact on the problem solving adequacy of the department and on educational efficiency, achievement, and student satisfaction.

Maturity of Co-op Program

Maturity of co-operative education programs (MAT) *was* considered a factor in this study. In some schools programs have been in place since the early 1970's while other programs are quite recent. One would expect that the length of time co-operative education programs had been in place within the school would impact not only on the problem solving adequacy of the department but on educational efficiency, achievement, and student satisfaction as well.

Problem Solving

All five problem solving activities *were* selected in this study. The problem solving activities based on perceptions of the co-operative education teachers within the department were expected to have implications for educational efficiency. The operational definitions for the five problem solving activities are presented below:

Resource Allocation

Resource allocation (RES) refers to teacher perceptions of the availability and sufficiency of resources for the department and satisfaction with services required for the delivery of co-operative education.

Coordination

Coordination (COORD) refers to teacher perceptions of the planning of work tasks and activities in the provision of co-operative education.

Integration

Integration (INTEG) refers to teacher perceptions in regard to the extent the administration understands and appreciates their work problems and needs and how strongly teachers are committed to the school and co-operative education program.

Strain

Strain (STRESS) refers to teacher perceptions of the amount of stress or tension they experience with others as they administer, implement, and deliver co-operative education.

Adaptation

Adaptation (ADAPT) refers to how well the co-operative education department meets community/employer expectations, engages in satisfactory relationships with interest groups, and collaborates with other schools and/or co-operative education departments for relevant services.

In the above discussion, variables selected for this study have been identified. The model used in the assessment of organizational effectiveness in co-operative education now includes the outcomes of organizational effectiveness (educational efficiency, achievement, and student satisfaction), various elements of school and program structure, student inputs, and variables related to the problem solving adequacy of the co-operative education department.

The following section is an examination of certain relationships among variables derived from the Model of Organizational Effectiveness Adapted for Co-operative Education.

Relationships Examined

In general, five clusters of relationships among the variables identified were examined. The reader is referred to Figure 3 for an overview of relationships among the various clusters of variables selected for this study.

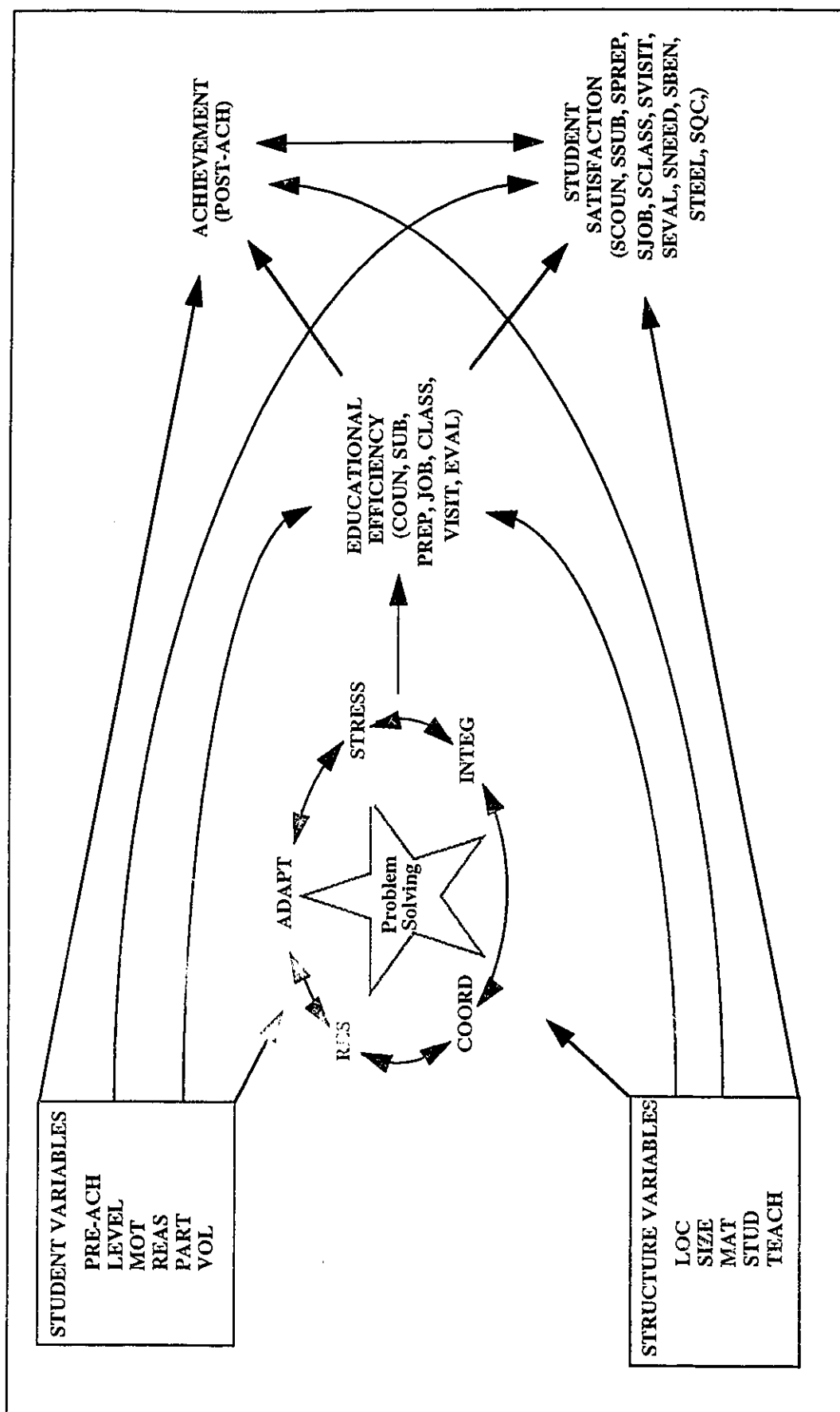


Figure 3. Test version of model of organizational effectiveness adapted for co-operative education

In the first cluster, *interrelationships* among the **Problem Solving** variables (coordination (COORD), integration (INTEG), level of strain (STRESS), adaptation to the external environment (ADAPT), and resource allocation (RES) were expected. As well, variables expected to relate to problem solving included *student inputs* (achievement at the time of entry into co-operative education (PRE-ACH), level of study (LEVEL), motivation to participate (MOT), reason to participate (REAS), part-time work experience (PART), and volunteer work experience (VOL)) and *structure variables* (size of school (SIZE), location (LOC), maturity of co-operative education program (MAT), number of students (STUD) and teachers (TEACH) involved in co-operative education).

For the second cluster, variables expected to relate to **Educational Efficiency** (counselling for co-operative education (COUN), related subject consonance (SUB) preparation for work (PREP), job placement consonance (JOB), classroom integration activities (CLASS), visits to the workplace (VISIT), and evaluation activities (EVAL)) included *student inputs*, *problem solving activities*, and *structure variables*.

For the third cluster, variables expected to relate to **Achievement** (POST-ACH) included *educational efficiency*, *student inputs*, and *structure variables*.

For the fourth cluster, variables expected to relate to **Student Satisfaction** in regard to counselling (SCOUN), related subject selection (SSUB), preparation for work (SPREP), job placement suitability (SJOB), classroom integration activities (SCLASS), visits to the workplace (SVISIT), evaluation process (SEVAL), extent program met needs (SNEED), benefits received (SBEN), recommendation of co-operative education to a friend (STELL), and overall quality of care (SQC) included *educational efficiency*, *student inputs*, and *structure variables*.

For the final cluster, outcome variables that were expected to be interrelated included **Achievement** and **Student Satisfaction**.

Following is a description of the instruments used to assess the variables selected for this study.

Measuring Instruments

For the purpose of this study, three instruments were employed, 1) a student questionnaire to assess organizational effectiveness and collect information on selected student inputs, 2) a teacher questionnaire to assess the problem solving adequacy of the co-operative education department, and 3) a co-operative education coordinator survey to collect data pertinent to school and co-operative education program structures.

Student Questionnaire

The student questionnaire was developed by the researcher with assistance from a variety of individuals. In the early stage of questionnaire development, the researcher interviewed a number of people involved in the delivery of co-operative education in order to understand more fully the guidelines for co-operative education (Ministry of Education, 1988) and the implication of those guidelines for the delivery of co-operative education programs. In addition, the researcher also met with small groups of secondary school co-operative education students in order to determine the key issues from various student perspectives. It should also be noted that the researcher has been involved in co-operative education both directly and indirectly since 1979 and has a strong foundation of knowledge and work experience to apply to this study.

As a result of these interviews and discussions, a preliminary questionnaire was developed based on the guidelines for co-operative education in the Province of Ontario (Ministry of Education, 1988) and students' feedback about their experiences. This questionnaire was then circulated to a number of individuals in the Provinces of British Columbia and Ontario for further feedback. These individuals included five university professors (two from measurement and three from educational administration), seven co-operative education administrators, five co-operative education teachers, five secondary school teachers, two district school officers, and twenty secondary school co-operative education students. The final student questionnaire included a combination of items related to organizational effectiveness (educational efficiency, achievement, student satisfaction), as well as items related to student inputs. Additional information collected did not have relevance for the study, but was collected to meet the needs of the school boards. A pilot study was conducted in British Columbia with 194 secondary school co-operative education students to collect reliability and validity data on certain measures used to assess organizational effectiveness and student inputs. The variables of the student questionnaire used in the present study are presented below (See Appendix A for a copy of the student questionnaire). The data from the pretest (Thibault, 1991) are presented and where appropriate, changes and revisions based on the results are integrated within the discussion. It should be noted that students were given the opportunity to make suggestions to improve the questionnaire items.

Educational Efficiency

Educational efficiency included seven scales (counselling for co-operative education (COUN), related subject consonance (SUB), preparation for work (PREP), job placement

consonance (JOB), visits to the workplace (VISIT), classroom integration activities (CLASS), and evaluation activities (EVAL)). Each scale comprised a varied number of items for a total of 42 (COUN, 5; SUB, 5; PREP, 5; JOB, 6; VISIT, 8; CLASS, 6; EVAL, 7). Students responded to each of the items using a Likert-type scale ranging from strongly disagree to strongly agree, respectively scored, 1 to 5. In order to reduce the perception of research bias, statements in the scales were both positive and negative. Scoring was reversed for negative statements. The higher the value assigned by the student, the higher the perception of educational efficiency.

In general, the statements in the scales of educational efficiency describe appropriate outcomes based on the policies and procedures for co-operative education (Ministry of Education, 1989). These outcomes are a reflection of the expectations about how each area is to be implemented by co-operative education staff in order to maximize student learning and benefits. More specifically, the scales assessed student perceptions of the outcomes of specific behaviours and activities and the extent to which they occurred for seven scales of educational efficiency.

In the scale COUN, students responded to five statements related to counselling for co-operative education (Appendix A, # 10). The five statements were intended to obtain information on how students felt about various aspects of the counselling process when they entered the program. Of particular interest was the nature of their relationship with the person giving them information, their satisfaction with the timetable to accommodate their school courses and work schedule, the opportunities provided by the counsellor to discuss the disadvantages or drawbacks of participating in co-operative education, their personal expectations, and their knowledge of the school's expectations. The pretest questionnaire included six statements. *One statement used in the pretest questionnaire was deleted for the final version.*

For the scale SUB, students responded to five statements concerning their in-school subject (Appendix A, # 15). Students in co-operative education integrate classroom studies with practical work experiences. Based on the policies and procedures for co-operative education, the nature of the related subject and classroom activities are important for the outcomes of co-operative education. In this study, the five statements included information on the similarity of the course content to the job, appropriateness of the homework assigned while working, encouragement by the classroom teacher to discuss the co-operative education job, effect of the co-operative education job on performance in the related subject, and meaning of the related subject as a result of job experience. *No changes were made to this scale for the final version.*

In the scale PREP, students responded to five statements concerning their preparation for the workplace (Appendix A, # 17). Before students enter the workplace, they receive formal preparation to ready them for their co-operative education jobs. They prepare resumes, write letters of application, assess personal skills, practice interview techniques, and receive workplace related information. The transition from the classroom to the co-operative education job is affected by the quality of the preparation process. In this study, statements for PREP included suitability of information received, usefulness of classroom activities, confidence to go out to work, understanding of suitable jobs, and amount of time for preparation. *No changes were made to this scale for the final version*

For the scale JOB, students responded to six statements about their work placement (Appendix A, # 21). All activities for co-operative education are related to the co-operative education job. Students receive counselling to find out how a job can help meet their goals or needs. They are taught job search skills and given information about the workplace. Their skills and interests are assessed and after an interview, they are matched with an appropriate employer. The placement arranged and approved by the school must provide adequate opportunities for learning. In this study, statements were related to whether jobs were in the students' areas of interest, their feelings about what they were learning, the nature of the job tasks assigned, reactions of co-workers to work performed, feelings about the hours spent on the job, and the value of work time. *One statement used in the pretest questionnaire was replaced for the final version.*

For the scale VISIT, students responded to eight statements about the monitoring at the workplace by the school (Appendix A, # 22). It is the responsibility of the school to visit students at work. This regular personal contact serves many purposes from making students feel connected to their school to increasing their chances for success. In this study, the statements were related to whether the visits kept students in touch with their schools, if the visiting teachers understood the kind of work students were doing, if students felt they could talk openly to their teachers, whether the visiting teacher provided any feedback on their progress, whether the visitor monitored the quality of the work being done, the importance of the visits for the employers and for themselves, and finally, the students' feelings about the frequency of the visits. *No changes were made to this scale for the final version.*

For the scale CLASS, students responded to six statements concerning the classroom activities to integrate school and work (Appendix A, # 24). Apart from the related subject, students meet with other co-operative education students at scheduled times to understand more clearly their school and work experiences. The classroom provides an opportunity for students to reflect, discuss, listen, share, and record their experiences

with their peers. In this study, statements were related to the atmosphere in the class, whether students were able to make connections between study and work, the usefulness of activities done in class, interest in topics discussed, feelings about meeting with co-operative education students, and implications of these meetings for their work time. *One statement in the pretest questionnaire for the scale CLASS was replaced for the final version.*

For the scale EVAL, students responded to seven statements concerning the evaluation process (Appendix A, # 26). The evaluation process is on-going and includes both formative and summative techniques and feedback from the school, employer, and student.. The teacher evaluates the student's performance in conjunction with the employer, but the school has responsibility for the student's final grade. In this study, statements were related to how students felt about the frequency of feedback from the school, the usefulness of feedback, whether employers were encouraged to discuss their reports with students, the school's effort to discuss employer reports with students, the fairness of the evaluation activities, the importance of the school's evaluation, and satisfaction with the school's evaluation. *No changes were made to the scale EVAL for the final version.*

Pretest Results for Scales of Educational Efficiency

As mentioned above, the scales of educational efficiency were pretested by Thibault (1991) in a pilot study with senior co-operative education students in British Columbia secondary schools. A test-retest procedure was used to determine the reliability of the questionnaire. Initial administration of the study occurred in ten schools during the months of May and June 1990. Retest dates were scheduled for a a period of three weeks following the initial administration. Test-retest questionnaires were matched based on student birthdates and gender. Since the measures used to assess educational efficiency included untested scales, two reliability coefficients (test-retest and alpha) were assessed (Thibault, 1991). Test-retest and alpha coefficients for the scales of educational efficiency are reported in Table 1.

Coefficients were seemingly adequate based on the fact that there was no identification of students and no incentive to provide the necessary information. The highest estimates for the test-retest were for counselling for co-operative education (COUN), evaluation activities (EVAL) and integration activities (CLASS). There was a tendency for larger alpha coefficients on the second administration. The greatest differences were for preparation for work (PREP), integration activities (CLASS), and counselling for co-operative education (COUN).

Table 1

Test-Retest and Alpha Coefficients for Seven Scales of Educational Efficiency (N=194)

Scale	Test-Retest	Alpha Time 1	Alpha Time 2
COUN	.78	.77	.81
SUB	.61	.68	.68
PREP	.63	.56	.67
JOB	.65	.75	.78
VISIT	.67	.78	.80
CLASS	.71	.73	.78
EVAL	.73	.80	.82

Validity estimates of the scales of educational efficiency were also obtained (Thibault, 1991). Some relationships were expected among the scales since the same individuals, for the most part, were interacting with students in the various areas of the co-operative education program. Each scale of educational efficiency was correlated with the other. Mean coefficients of each variable with the other six for the first and second administration are reported in Table 2.

The results show the scales are distinct, but also related. In general, coefficients are larger for the second administration. Mean correlation coefficients for the first administration ranged from .25 to .47. Mean correlation coefficients for the second administration ranged from .28 to .51. The increases from time one to time two are fairly consistent for all scales except SUB which was much higher on the second administration. It is possible that the three week period between administrations gave students some new information from which to assess the related subject. As the content of the questionnaire was exposed following the first administration, related subject teachers may have addressed some of the questionnaire issues. This, in turn, may have influenced student perceptions. While students were asked to complete the questionnaire using the same point of reference on both occasions, this was not possible to control.

Table 2

Mean Correlations of Scales of Educational Efficiency with Each Other Over Two Test Administrations (N=194)

Scale	Administration	
	1	2
COUN	.45	.46
SUB	.38	.51
PREP	.37	.38
JOB	.25	.28
VISIT	.47	.48
CLASS	.45	.45
EVAL	.44	.50

Some relationships among the scales of educational efficiency were expected. For the most part, the same individuals were involved in providing care and service in the seven areas to students in co-operative education. Therefore, the tasks and activities of the staff in one area were expected to relate to the tasks and activities of the staff in another area. The low correlation coefficient for JOB with the others was expected given that the workplace is primarily the responsibility of the employer. Teacher involvement at the workplace is far less than in other areas.

As a result of the pretest data for reliability and validity Thibault (1991), revisions were made to three scales of *educational efficiency* (COUN, JOB, CLASS). In general, if the reliability of the scale improved a reasonable amount when an item was deleted because of a low item-remainder correlation (the correlation of the item with the sum of the other items), the item was removed from the scale. For two scales (JOB, CLASS), replacement items were added, based on comments from students.

For the scale counselling for co-operative education (COUN), one statement was *deleted*. The lowest item-remainder correlation was found for the statement, 'The counsellor was interested in what I hope to do after graduation'.

For the scale job placement consonance (JOB), one statement was *deleted* and one statement was *added*. The lowest item-remainder correlation was found for the statement, 'I am able to do the things expected of me on the co-op job'. One statement was added

related to comfort with co-workers 'The people I work with like what I do' (Appendix A, # 21-4).

For the scale classroom integration activities (CLASS), one item was *deleted* and a new item was *added*. The lowest item-remainder correlation was found for the statement, 'More time should be spent in class with co-operative education students'. The new item was 'My work time means more to me after meeting with co-op students' (Appendix A, # 24-6).

The next section of the student questionnaire related to organizational effectiveness includes measures of *achievement* and *student satisfaction*. A description of these measures follows. As in the above section, revisions relevant to the measures of achievement and student satisfaction based on pretest data (Thibault, 1991) are integrated within the discussion.

Achievement

For the measure of achievement (POST-ACH), students were asked to report their overall grade percentage near the completion of the co-operative education program (Appendix A, # 5). It should be noted the survey was administered near the completion of the school year. *This item was pretested*, however, test-retest reliability was not possible because of a technical error.

Student Satisfaction

Student satisfaction included a total of 11 measures. All measures of student satisfaction included interval type data. *Eight of these measures were not pretested by Thibault (1991).*

For seven measures of satisfaction (Appendix A, # 27), students were required to rate on a scale from poor to excellent, respectively scored 1 to 5, the overall quality of service received from the school for seven corresponding measures of educational efficiency, counselling for participation in co-op (SCOUN, 1 item), selection of related co-op course (SSUB, 1 item), preparation for the workplace (SPREP, 1 item), suitability of work placement (SJOB, 1 item), visitation at the workplace (SVISIT, 1 item), activities to link school and work (SCLASS, 1 item), and grading of co-op experiences (SEVAL, 1 item). *These seven measures of student satisfaction were not pretested by Thibault (1991).*

For the other four measures of satisfaction, students were required to respond to various questions. For the first question, students were asked to rate on a scale from 1 to 5, how much the co-op program met their need (SNEED, 1 item, Appendix A, # 28). The

scale ranged from, 'Did not meet this need' to 'Completely met this need'. *This item was not pretested.*

For the second question, students were asked to select from four options how much they benefitted from the co-op program (SBEN, 1 item, Appendix A, # 29). The options included, 'I did not benefit at all', 'Not as much as I hoped for', 'Exactly what I hoped for', and 'More than I had hoped for'. These options were respectively scored 1, 2, 3, and 4. *This item was pretested and revised.* In the pilot study, students were asked to respond "yes or no" to the question, 'Did you gain anything from the co-op experience?' It was felt that the validity of SBEN could improve if the item was revised so that students could indicate the extent to which they had benefitted overall.

For the third question, students were asked to select from three options whether they would tell a friend to take co-op (STELL, 1 item, Appendix A, # 30). The three options provided were, 'yes, maybe, and no' respectively scored 2, 1, and 0. *This item was pretested and revised from the pretest.* In the pilot study, the percent agreement (73%) over the two administrations was adequate, however, students felt that a response of 'yes or no' to the question, 'Would you tell a friend to take co-op?' was not sufficient. It was hoped the addition of a third option 'maybe' would improve the validity of STELL which in the pilot study correlated quite poorly over the two administrations with the scales of educational efficiency (.28).

For the final question, students were asked to rate on a scale from 1 to 10, the overall quality of care received from the school while they were in the co-op program (SQC, 1 item, Appendix, A # 33). *This item did not change from the pilot questionnaire.* The test-retest coefficient was adequate at .73. The validity of the SQC scale was tested in regard to how well it correlated with the seven measures used to assess educational efficiency. The mean correlation of SQC with the seven measures over the two administrations was .57. The highest correlations were found with evaluation activities (EVAL, $r = .63$), counselling for co-operative education (COUN, $r = .62$), and integration activities (CLASS, $r = .58$). Not surprising, the lowest correlation was found for the workplace (JOB, $r = .26$). As seen above, the scale JOB had the lowest correlation with all other scales of educational efficiency. Students likely perceive their employers as more responsible for what goes on at the workplace. To facilitate data analyses, SQC was later recoded to a four point scale.

For all measures of educational efficiency, achievement, and student satisfaction, the higher the value assigned by the student, the greater their perceptions of organizational effectiveness in co-operative education.

The final part of the student questionnaire to be discussed includes variables identified as *student inputs*. Pretest data (Thibault, 1991) as well as revisions to certain of these variables are integrated within the discussion.

Student Inputs

In this study, six measures were used to assess student inputs. For the first measure, achievement prior to entering the program (PRE-ACH), students were asked to select from five options the letter grade which best represented their overall average at the time when they applied to take the co-op program (Appendix A, # 4). The options included five categories A (80-100%), B (70-79%), C (60-69%), D (50-59%), and E (Below 50%). *PRE-ACH was revised from the pilot questionnaire.* In the pilot study, students were required to report their overall average grade as an exact percentage. Many students had difficulty in specifying an exact percentage. No reliability measure of PRE-ACH over the two administrations was possible because of a technical error.

For the second measure, students were asked to indicate the level of study (LEVEL) for the majority of their classes (Appendix A, # 6). Three options, 'basic, general, or advanced' were provided and numerical values of 1, 2 and 3 were assigned respectively. *Pretest data were not considered relevant for LEVEL since students in British Columbia select regular or honors courses.*

For the third measure, students were asked to choose from three options how much they wanted to take the co-op program (MOT, Appendix A, #.7). The three options included 'Very much', 'Somewhat', and 'Not very much' respectively scored 3, 2, and 1. *The measure MOT was revised from the pretest.* In the pilot study, students were required to rate on a scale from 1 to 10 how important it was for them to take co-operative education. The correlation coefficient over two administrations for MOT was considered adequate ($r = .79$). However, the validity of the scale MOT in regard to how well it correlated with the seven measures of educational efficiency was tested and found very low. The mean correlation coefficient over the two administrations was only .17. Therefore, it was felt a reduced scale could improve the validity.

The fourth student input measure was related to the reasons why students participate in co-operative education (REAS, Appendix A, #8). Students were asked to indicate in an open-ended question, their most important reason for taking co-op. Options for the variable REAS were then coded as either academic reasons (1) or career related reasons (2). *REAS was revised from the pretest.* In the pilot study, students were asked to select from ten options, in order of importance, the three most important reasons for taking co-operative education. The percent agreement coefficients over the two

administrations for the 1st, 2nd, and 3rd reasons were relatively low at .43, .33, .21. Asking students to rank order the reasons from so many options proved difficult. Ranking varied over the two administrations and analysis was a problem. No assessment was made of the validity of REAS; however, revision of REAS was expected to improve the validity and to simplify the response for students.

Two final measures of inputs were related to students' work experiences prior to taking co-operative education. For each of these measures, students were asked to check from three options how often they were involved in part-time (PART) work experiences and volunteer (VOL) work experiences (Appendix A, # 9). The options included 'Regularly', 'Occasionally', and 'Never' respectively scored 3, 2, and 1. To facilitate data analyses, responses for PART and VOL were later recoded as either 1, for " no experience" or 2, for " experience". *These two items were added to the final questionnaire and therefore, were not pretested.*

The above information describes the content of the student questionnaire to collect data on organizational effectiveness and student inputs. The next part is a description of the second instrument used in this study, the teacher questionnaire.

Teacher Questionnaire

The teacher questionnaire was used to assess the problem solving adequacy of the staff who work together in the co-operative education department (see Appendix B). The questionnaire included data related to background information as well as data on problem solving in five activities. The data collected on the background of teachers included information on gender, primary role in co-operative education, co-operative education workload, qualifications for co-operative education, and years of co-operative education experience. This information was not used in this study; however, it was included in the report to the school boards involved in this study (Thibault, 1993).

Five scales with 46 items in total were used to measure the problem solving adequacy of the staff involved in co-operative education. The five scales included coordination (COORD, 7 items), integration (INTEG, 3 items), level of strain (STRESS, 9 items), adaptation (ADAPT, 17 items), and resource allocation (RES, 10 items). These measures were adapted from Georgopoulos et al (1980). All scales for the problem solving variables included interval type data with values ranging from 1 to 5. The higher the value assigned by the teacher, the greater the perception of the problem solving adequacy of the co-operative education department. Scoring for items related to the scale STRESS was reversed so that high scores indicated low strain. Minor revisions to the

original items included the substitution of hospital terminology with appropriate terms for co-operative education in schools, and in some cases, the deletion of certain words to improve the readability of the item. For example, one item used by Georgopoulos et al (1980) reads:

"When you request the services, assistance, or support of others (outside the emergency unit), on the whole, how satisfactorily are your demands met by each of the following?

Adapted for this study, the question was changed to read:

"When you request the services, assistance, or support of others (outside of the co-op department), how satisfactorily are your demands met by each of the following?"

Items for COORD were related to how well the teaching assignments are planned and timed, how well the activities fit together around the co-op students, how frequently the staff do their jobs jointly, the extent to which the staff make work adjustments and take into account each other's work problems, and how successful the staff are at finding better ways of fitting together their related work efforts and activities (Appendix B, Part II, A1-A7).

Items for INTEG were related to how well the administration understands and appreciates the work problems and needs of co-op staff, and how strongly committed teachers are to their school and the co-op program (Appendix B, Part II, B8-B9, note: B-9 has two parts).

Items for STRESS were related to the amount of tension between co-operative education teachers and various individuals and groups within the school and in the external environment. Internal groups included administrators, regular teachers, co-operative education students, other co-operative education teachers, support personnel, and co-operative education employers. External groups included school boards, labour organizations, government employment agencies, co-operative education advisory committees, professional co-operative education associations, post-secondary institutions, and the Ministry of Education (Appendix B, Part II, C10-C12, D20).

Items for ADAPT were related to the reputation of the co-operative education department within the community, the provision of adequate information about co-operative education services for employers, the ability of the department to respond to changing community needs and to meet community expectations, the appropriateness of community expectations regarding co-operative education, the extent of collaboration with others to

provide better services, improve the work of the department, share useful information, establish and maintain special co-operative education facilities, and to provide training for co-operative education staff and support personnel, and satisfaction with contacts from groups indirectly involved in co-operative education as mentioned above (Appendix B, Part II, D13-D19). It should be noted that for level of satisfaction with outside groups, a "no contact" option was provided and assigned a low score of 1. The decision was based on the fact that for this study, contacts with outside groups were considered an important part of the problem solving activity of adaptation to the environment.

Items for RES were related to how sufficient the resources are to ensure a quality program in regard to staffing for co-operative education, guidance personnel for counselling and timetabling, employers for job placements, operational funds, information received from other parts of the school, and the space and facilities for co-operative education, as well as how satisfactory requests for assistance are met from guidance, office personnel, other departments, and administration (Appendix B, Part II, E21-E22).

The above information detailed the content of the teacher questionnaire. Information on the final instrument used in this study, the coordinator survey, is presented below.

Coordinator Survey

A one page survey for co-operative education coordinators was developed by the researcher to collect information on certain structure characteristics of schools and co-operative education programs (see Appendix C). The purpose was to determine whether selected characteristics might be related to the problem solving adequacy of the staff and to organizational effectiveness. Some additional information collected was intended to verify expected similarities in school and program structure. This information was related to type of school term (semester or traditional), type of program (basic, general, advanced), grade level of students (10, 11, 12, OAC), number of hours worked for one credit, work schedule (half days, full days, block time), typical number of placements per student/year, designated related subject (cross curriculum, guidance), presence of board coordinator and school coordinator

Five measures were used in total to collect data on the the structure characteristics of the school and co-operative education program. Related to school structure, coordinators were asked to indicate whether the *location* (LOC) of the school was " rural " or " urban " (Appendix C, # 5). In addition, they were asked to report the *size of the school* (SIZE) based on student enrolment (Appendix C, # 4). Since all schools were generally large,

responses were later categorized as schools with a " population less than or equal to 1000 " or schools with a " population greater than 1000". Related to the structure of the co-operative education program, coordinators were asked to indicate the *maturity of the co-op program* (MAT) in terms of the number of years co-operative education had been in place in the school (Appendix C, # 7). Responses were later categorized into three stages of maturity, " five years or less ", " six to nine years ", and " ten or more years ". Two measures were used to determine the size of the co-operative education program. Coordinators were asked to report the *number of students* (STUD) involved over the school year and the *number of teachers* (TEACH) involved over the school year (Appendix C, # 8, # 11). Responses related to STUD were later categorized as " Lo through 75 students ", "76 through 125 students", and "126 and larger". Responses related to TEACH were later categorized to include, " three or fewer teachers", "four or five teachers", and " six to nine teachers".

The following section describes the research sample and methods for data collection.

Research Sample and Data Collection

Schools

Six schools boards from eastern and northern Ontario were initially invited to participate in this study. Four school boards accepted the research proposal. It should be noted that one of the two schools boards which did not participate declined because of a pending teacher strike; the other school board declined because it was planning an internal study of co-operative education. The teachers from both of these school boards were in fact on strike at the time of data collection.

A total of 26 schools were invited to participate in this study. However, five schools from three areas (Carleton, Cornwall, Cobourg) declined to participate. Reasons cited included small program size and conflict between proposed data collection dates and school related activities. As a result, 21 schools from the areas of Carleton, Cornwall, Cobourg, and Sudbury were involved in this study (see Table 3).

All schools which participated were comprehensive schools providing courses leading to the Ontario Secondary School Diploma (OSSD). In order to obtain the OSSD, students must acquire a minimum of 30 credits. All schools also offered courses for Ontario Academic Credits. For students to attend universities in Ontario, six Ontario Academic Credits are required.

Table 3

Frequencies by Area for Schools and Research Subjects

Sample	Area				Total
	Cornwall	Carleton	Cobourg	Sudbury	
Schools	4	5	7	5	21
Students	112	201	206	129	648
Teachers	12	25	29	23	89
Coordinators	4	5	7	5	21

Students

Based on information provided by the coordinator in each school, there was a potential for 985 students to be involved from the 21 schools. Since students were split into groups according to a morning or afternoon work schedule, only those students who were in school for regular integration or in-school activities at the time of the scheduled administration date were able to participate. As a result, 661 senior co-operative education students were in attendance at the time of the study. All of these students agreed to participate.

The questionnaire was administered by the researcher to co-operative education students, during regular class periods, between the months of April to June 1992. Administration during the month of April was somewhat earlier than intended; however, two schools requested early administration due to unusual circumstances. One school was closing early due to construction. In the other school, the co-operative education coordinator was scheduled to be absent for the period of the study. Also, because of a conflict in schedules, the co-operative education coordinator from one school administered the student questionnaires. For this school only, arrangements were made for a co-operative education student to collect the completed questionnaires and seal in an envelope before mailing directly to the researcher.

Prior to the administration of the questionnaire, the researcher briefly introduced the study to the students, discussed the importance of their contribution to the research process, and emphasized the confidentiality and anonymity of their responses. Students were also reminded that their participation was voluntary and that they could choose not to

participate without consequences. Students were also encouraged to complete all questions. Not all co-operative education students scheduled to be in class during the administration of the questionnaire were present because of conflicting work schedules, illness, field trips, and a small percentage who may have skipped class. Time taken to complete the questionnaire ranged from 20 minutes to 45 minutes. All questionnaires were collected by the researcher at the end of the administration period. From the total number of questionnaires distributed, only thirteen questionnaires could not be included in the analyses because of the lack of information for all measures of organizational effectiveness. These questionnaires represented a small number of students from different schools. There was no reason to believe that responses from these students would have changed the overall results. As a result, questionnaires from 648 students (98%) were used for analyses (see Table 3). In general, students were very receptive to the study and the opportunity to provide information to a neutral party.

Teachers

A total of 113 teachers involved in the administration, delivery, and implementation of co-operative education programs, including guidance personnel involved in the counselling of co-operative education students were invited to participate in this study. Questionnaires, coded by school, were delivered to the teachers in the 21 schools at the time of administration of the student questionnaires. While some teachers were available at this time to complete the questionnaire, many were in class and unavailable to complete the survey. For this reason, each questionnaire left with the teacher contained a cover letter explaining the purpose of the study, assurance of complete anonymity and confidentiality of responses, and a stamped self-addressed envelope for direct return to the researcher. Follow-up letters were sent to each school to maximize questionnaire returns. Before the end of June, schools with outstanding teacher questionnaires were telephoned with a last, gentle reminder to encourage teachers to send in their questionnaires. From the total questionnaires distributed, 92 questionnaires (81%) were returned. Three of these questionnaires were not included in the analyses. For two questionnaires, the identification code had been torn off making it impossible to identify the school. The third questionnaire was incomplete for all measures of problem solving. As a result, questionnaires from 89 teachers were used for analyses (see Table 3).

Coordinators

The co-operative education coordinator or contact in each of the 21 participating schools was interviewed to provide pertinent school and co-operative education program information. The interview was scheduled on the same day the questionnaire was administered to co-operative education students. The interview lasted approximately fifteen minutes. As a result, information from 21 co-operative education coordinators was used for analyses (see Table 3). The researcher also collected co-operative education program brochures and school course calendars wherever possible to substantiate responses.

The final section of this chapter is a presentation of the procedures used for data analysis.

Data Analysis

In order to establish the reliability of the student and teacher questionnaires, reliabilities of the scales used to assess educational efficiency and problem solving were estimated using the alpha coefficient. To examine validity of the items of each scale, item-remainder coefficients (the correlation of the item with the sum of the other items) were estimated.

In order to test the Model of Organizational Effectiveness Adapted for Co-operative Education, a number of relationships were analyzed using various statistical procedures (see Figure 4).

It was important to address the relationships among variables in a sequential manner. Five main clusters of relationships were identified earlier including variables related to problem solving, educational efficiency, achievement, student satisfaction, and outcome variables that were interrelated (achievement and student satisfaction).

For the first set of relationships, the *interrelationships* among **Problem Solving** activities (coordination (COORD), integration (INTEG), strain (STRESS), adaptation (ADAPT), resource allocation (RES)) were determined. Then, a set of predictor variables including *student inputs* (achievement (PRE-ACH), level of study (LEVEL), motivation (MOT), reason to participate (REAS), part-time (PART) and volunteer (VOL) work experiences) and *structure* (size of school (SIZE), location (LOC), maturity of co-operative education program (MAT), number of students (STUD) and teachers (TEACH) involved in

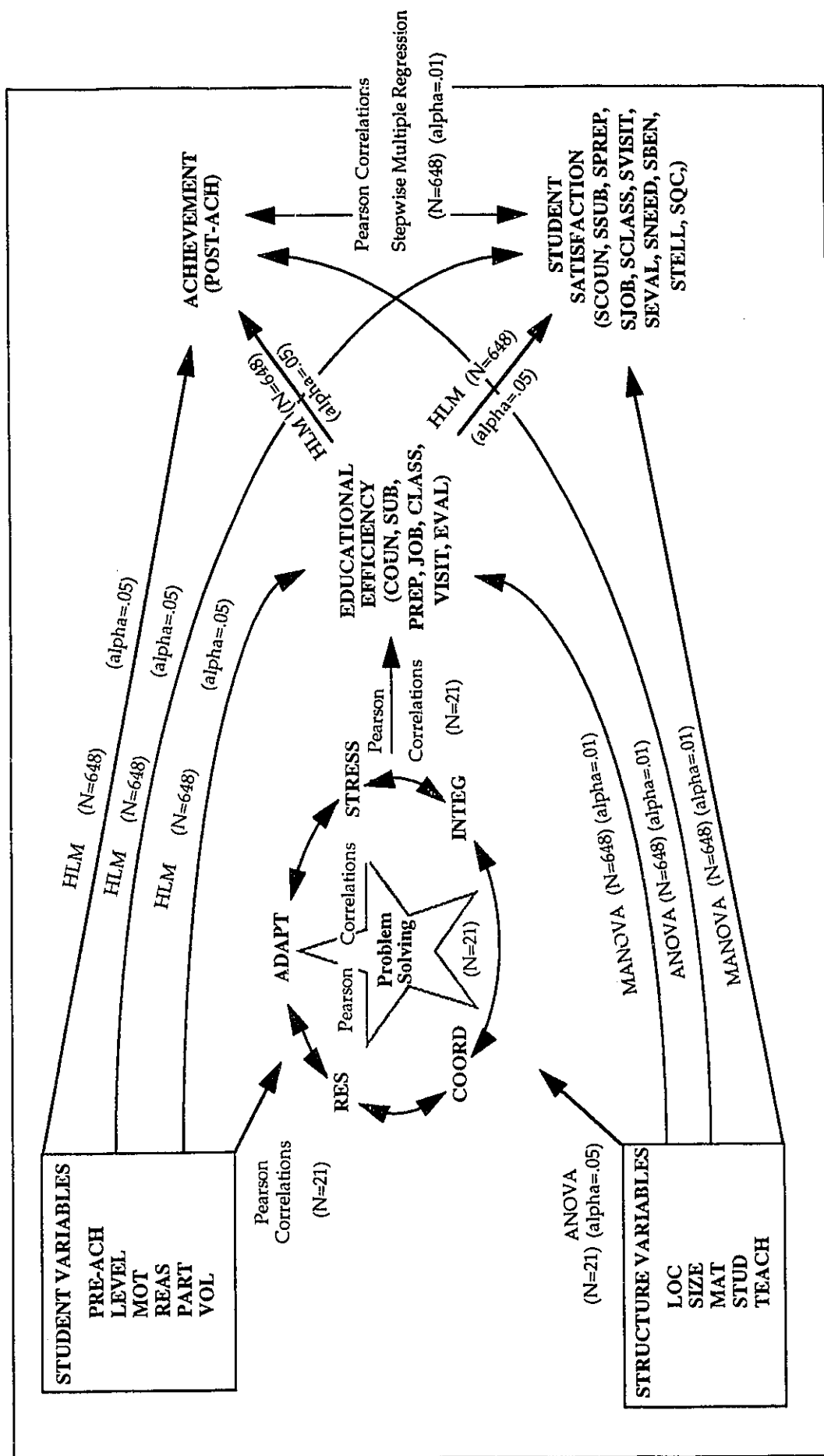


Figure 4. Data analysis used to test relationships in model of organizational effectiveness adapted for co-operative education

co-operative education) were examined in regard to their relationships with **Problem Solving** activities. Three separate tests were conducted. For all tests involving problem solving activities, department scores were used (N=21). In the first test, the interrelationships among problem solving were examined using Pearson product moment correlations. Second, to test the relationships among student inputs and problem solving activities, Pearson product moment correlations were again performed. The mean student score by school for six student inputs was correlated with the mean teacher score by school for the five problem solving activities (N=21). Correlations were considered appropriate given the use of mean school scores and the small sample size. Third, one-way analyses of variance was conducted to determine differences by category for each structure variable with measures of problem solving (N=21). When there were significant effects, post-hoc analyses, using Scheffe's statistic ($\alpha=.05$), determined significant differences among groups.

For the second set of relationships, a set of predictor variables including *student inputs* (achievement, level of study, motivation, reason to participate, part-time and volunteer work experience), *problem solving activities* (coordination, integration, stress, adaptation, resource allocation), and *structure* (size of school, location, maturity of co-operative education program, number of students and teachers involved in co-operative education) were examined in regard to relationships with **Educational Efficiency** (counselling (COUN), related subject (SUB), preparation for work (PREP), job placement (JOB), classroom integration activities (CLASS), visits to the workplace (VISIT), evaluation activities (EVAL). Three separate tests were conducted. First, a two-level hierarchical linear model (HLM) using the micro computer program (HLM-2) was used to test relationships among student inputs and educational efficiency. While one might have normally used multiple regression, HLM is a more precise analysis, particularly for the estimation of within-school variance. Furthermore, the HLM procedure allows one to estimate the proportions of variance in an outcome among schools (Rowan, Raudenbush, & Cheong, 1993). Since it was not known whether schools by nature of their independence would make a difference, the estimation of the between-schools variance was important to assess. For data analyses, individual student scores were used for student inputs and educational efficiency (N=648). For the second test, Pearson product moment correlations were used to determine which problem solving variables were related to measures of educational efficiency. Mean department scores by school were used for problem solving and mean student scores by school were used for educational efficiency (N=21). Correlations were considered appropriate given the use of school means and the small sample size. For the third test, in order to determine differences by category of

structure for educational efficiency (N=648), multivariate analyses of variance (MANOVA). When MANOVA was significant for a level of significance set at .01, analyses of variance (ANOVAS) were performed to determine significant univariate effects. When necessary, post hoc analyses were performed using Scheffe's statistic. Leary and Altmaier (1980) justify using a MANOVA as a preliminary to multiple (ANOVAS) to control Type I error probability. They recommend that data interpretation be based on the ANOVA results.

For the third set of relationships, the predictor variables of *student inputs* (achievement, level of study, motivation, reason to participate, part-time and volunteer work experience), *educational efficiency* (counselling, related subject, preparation for work, job placement, classroom integration activities, visits to the workplace, evaluation activities), and *structure* (size of school, location, maturity of co-operative education program, number of students and teachers involved in co-operative education) were examined to determine relationships with **Achievement** (POST-ACH). For student inputs and educational efficiency, HLM analyses were used to assess the effects of these within-school variables on achievement (N=648). Because of the limits imposed by HLM-2 which restricts the number of variables which can be used at a time, it was necessary to run two separate tests. The effects of student inputs on achievement were assessed separately from the effects of educational efficiency.

For the fourth set of relationships, a set of predictor variables including *student inputs* (achievement, level of study, motivation, reason to participate, part-time and volunteer work experience), *educational efficiency* (counselling, related subject, preparation for work, job placement, classroom integration activities, visits to the workplace, evaluation activities), and *structure* variables (size of school, location, maturity of co-operative education program, number of students and teachers involved in co-operative education) were examined in terms of their association with 11 measures of **Student Satisfaction**. Measures of student satisfaction related to counselling (SCOUN), related subject (SSUB), preparation for work (SPREP), job placement (SJOB), classroom integration activities (SCLASS), visits to the workplace (SVISIT), evaluation activities (SEVAL), as well as, extent program met needs (SNEED), benefits received (SBEN), recommendation of co-operative education to a friend (STELL), and overall quality of care received (SQC). Three separate analyses were done. First, in order to assess relationships among student inputs and student satisfaction from a sample of 648 students, HLM-2 analyses were used. Similar analyses were done in the second test to determine relationships among educational efficiency and student satisfaction. Level of significance was set at .05. Third, to assess differences by structure variables and

measures of student satisfaction, multivariate analyses of variances were conducted (MANOVA). When MANOVA was significant for a level of significance set at .01, analyses of variance (ANOVAS) were performed to determine significant univariate effects. When necessary, post hoc analyses were performed using Scheffe's statistic. Individual scores for a sample of 648 students were used for measures of student satisfaction.

In the final set, interrelationships between **Achievement** and **Student Satisfaction** were also explored. Two analyses were conducted. First, Pearson product moment correlations were used to examine relationships between student satisfaction and student achievement (N=648). In the second test, multiple stepwise regression analyses were done to determine the contribution of the independent variables (measures of student satisfaction) to the variation of the dependent variable (post-achievement). Individual scores for a sample of 648 students were used with a level of significance set at .01.

The next chapter includes the presentation and discussion of the results.

CHAPTER IV

RESULTS AND DISCUSSION

In this chapter, the results are presented and discussed in two main parts. The first part includes the reliability and validity of the student and teacher questionnaires. The second part includes testing the relationships derived from the model.

Reliability and Validity of Instruments

Student Questionnaire

In order to establish the reliability of the seven scales of educational efficiency, reliabilities were estimated using the alpha coefficient. They were: .92 for visits to the workplace (VISIT), .79 for job placement (JOB), .76 for evaluation activities (EVAL), .72 for classroom integration activities (CLASS), .55 for preparation for the workplace (PREP), .55 for related subject (SUB), and .52 for counselling for co-operative education (COUN). The alpha coefficients for the scales JOB, VISIT, CLASS, and EVAL were higher than those obtained in the pretest (Thibault, 1991). For three scales, COUN, SUB, and PREP, the alpha coefficients were lower than in the pretest.

One would expect there to be relationships among the seven scales of educational efficiency; these are reported in Table 4.

The mean correlation coefficients for the seven scales of educational efficiency with each of the six others were roughly the same, ranging from .30 to .39. Classroom integration activities (CLASS) and evaluation activities (EVAL) had the highest degree of association ($r = .57$). Moderate relationships found for counselling (COUN) with preparation for the workplace (PREP), evaluation activities (EVAL), and the job placement (JOB) may reflect some duplication of information as students participate in various aspects of the program. The lowest correlations were found for visits to the workplace (VISIT) with the related subject (SUB), the job placement (JOB), and preparation for work (PREP). In general, the relationships and their magnitude suggest that these scales were valid measures of educational efficiency.

Table 4

Correlation Coefficients Among Scales of Educational Efficiency (N=648)

Scale	Educational Efficiency **						
	COUN	SUB	PREP	JOB	VISIT	CLASS	EVAL
SUB	.32						
PREP	.47	.35					
JOB	.41	.35	.44				
VISIT	.32	.20	.26	.24			
CLASS	.36	.40	.33	.27	.37		
EVAL	.44	.29	.36	.31	.38	.57	
Mean	.39	.32	.37	.34	.30	.38	.39

Note. All correlation coefficients are statistically significant at ** $p < .01$

It was impossible to estimate reliabilities for measures of student satisfaction as they were single item measures. However, relationships among measures of student satisfaction were expected. Three sets of relationships are of interest. First is the set of relationships among the seven satisfaction measures which correspond to educational efficiency. These include student satisfaction with counselling (SCOUN), related subject selection, (SSUB) preparation for work (SPREP), job placement suitability (JOB), classroom integration activities (SCLASS), visits to the workplace (SVISIT), and the evaluation process (SEVAL). Second is the set of relationships related to the extent the program met student needs (SNEED), the benefits received (SBEN), recommendation of co-operative education to a friend (STELL), and overall quality of care received (SQC). And third is the set of relationships between these two sets. The results for the first set of relationships are reported in Table 5.

The mean correlation coefficients of the seven corresponding scales of student satisfaction (SCOUN to SEVAL) with each other were roughly the same (.36 to .44). Satisfaction with counselling (SCOUN) was moderately related (.40 or greater) to each of the other variables. The highest correlation was found for satisfaction with counselling (SCOUN) and the related (SSUB, $r = .51$). It makes sense that student satisfaction with the counselling process would relate to the selection of the in-school subject since course selection is a guidance function. Correlations ranging from .40 to .46 were found among

all other pairs of variables exclusive of satisfaction with visits to the workplace (SVISIT) and the job placement (SJOB).

Table 5

Correlation Coefficients Among Seven Measures of Student Satisfaction (SCOUN to SEVAL) (N=648)

Measure	Student Satisfaction**						
	SCOUN	SSUB	SPREP	SJOB	SVISIT	SCLASS	SEVAL
SSUB	.51						
SPREP	.45	.42					
SJOB	.40	.40	.45				
SVISIT	.41	.29	.29	.28			
SCLASS	.46	.43	.41	.28	.43		
SEVAL	.42	.44	.44	.39	.44	.43	
Mean	.44	.42	.41	.39	.36	.41	.43

Note. All correlation coefficients were statistically significant at ** $p < .01$

The lowest correlations overall were found for two satisfaction variables most directly related to the workplace, visits to the workplace (SVISIT) and job placement (SJOB). One would not expect the interaction between the student and visiting teacher to have much in common with the in-school subject or the actual preparation for work. However, it was surprising that satisfaction with the visits to the workplace (SVISIT) showed only a small relationship with the job placement (SJOB). This was consistent with the relationship between JOB and VISIT. The lower correlation ($r = .28$) between satisfaction with the job placement (SJOB) and classroom integration activities (SCLASS) was expected since the activities on the job differ from the activities in the class. These relationships generally support the validity of these measures of student satisfaction.

Results for the second set of relationships related to the extent the co-operative education program met student needs (SNEED), benefits received (SBEN), recommendation of co-operative education to a friend (STELL), and overall quality of care (SQC) are reported in Table 6.

The mean correlation coefficients ranged from .38 to .47. The extent co-operative education met student needs (SNEED) correlated most highly with each of the others ($r = .47$). Mean coefficients were roughly the same for two measures, extent of benefits received (SBEN, $r = .43$) and recommendation of co-operative education to a friend (STELL, $r = .41$). The lowest mean correlation was found for overall quality of care (SQC) with each of the others ($r = .38$). The correlations among the four measures were all very similar with the exception of the highest correlation ($r = .56$) found between extent program met needs (SNEED) and benefits received (SBEN). It was not surprising that the extent the program met student needs (SNEED) also correlated moderately with recommendation of co-operative education to a friend (STELL, $r = .44$) and overall quality of care (SQC, $r = .41$). The lowest correlations were found for student perceptions of the overall quality of care (SQC) with recommendation of co-operative education to a friend (STELL, $r = .39$) and extent of benefits received (SBEN, $r = .33$). The extent of the relationships among these measures of student satisfaction suggests that these measures are valid.

Table 6

Correlation Coefficients Among Four Measures of Student Satisfaction (SNEED to SQC)
(N=648)

Measure	Student Satisfaction**			
	SNEED	SBEN	STELL	SQC
SBEN	.56			
STELL	.44	.41		
SQC	.41	.33	.39	
Mean	.47	.43	.41	.38

Note. All correlation coefficients are statistically significant at $**p < .01$.

Results for the third set of relationships among seven measures of student satisfaction corresponding to educational efficiency (SCOUN to SEVAL) and four satisfaction measures (SNEED to SQC), are reported in Table 7.

The mean correlation coefficients for measures SCOUN to SEVAL with SNEED to SQC ranged from .24 to .36. Not surprisingly, the highest mean correlation ($r = .36$) was found for suitability of job placement (SJOB) with the extent program met student needs

(SNEED), benefits received (SBEN), recommendation of co-operative education to a friend (STELL), and overall quality of care (SQC). The means for the others were all fairly similar except for preparation for the workplace (SPREP) which had the lowest mean correlation ($r = .24$) with the others. The mean coefficients for SNEED to SQC with SCOUN to SEVAL ranged from .22 to .40. The highest mean was found for overall quality of care (SQC, .40). The means for extent program met needs (SNEED) and recommendation of co-operative education to a friend (STELL) were roughly the same (.30, .26). The lowest mean coefficient was found for extent of benefits received (SBEN, .22).

Table 7

Correlation Coefficients for Seven Measures of Student Satisfaction (SCOUN to SEVAL) with Four Other Measures of Student Satisfaction (SNEED to SOC) (N=648)

Measure	Student Satisfaction**							Mean
	SCOUN	SSUB	SPREP	SJOB	SVISIT	SCLASS	SEVAL	
SNEED	.27	.32	.27	.43	.28	.24	.29	.30
SBEN	.21	.24	.12	.33	.22	.18	.25	.22
STELL	.25	.29	.20	.29	.25	.27	.25	.26
SQC	.42	.33	.35	.38	.47	.38	.46	.40
Mean	.29	.30	.24	.36	.31	.27	.31	

Note. All correlation coefficients are statistically significant at $**p < .01$.

Relationships among all variables ranged from .12 to .47. Moderate relationships were found for overall quality of care (SQC) with visits to the workplace (SVISIT, $r = .47$), evaluation process (SEVAL, $r = .46$), and counselling for co-operative education (SCOUN, $r = .42$). To a lesser extent, similar relationships were found for overall quality of care (SQC) with classroom activities (SCLASS), job placement suitability (SJOB), preparation for work (SPREP), and related subject selection (SSUB). Not surprisingly, the extent students felt their needs had been met (SNEED) was moderately related to satisfaction with the job placement (SJOB, $r = .43$). To a lesser extent, student satisfaction with the counselling received (SCOUN), related subject selection (SSUB), preparation for work (SPREP), job placement suitability (SJOB), visits to the workplace (SVISIT), classroom

activities (SCLASS), and evaluation process (SEVAL) were not highly related to whether students would recommend co-operative education to a friend (STELL) or the extent to which they benefitted from the program (SNEED). Generally, validity is supported by relationships among variables that should be related. This was found for both educational efficiency and student satisfaction. For measures of student satisfaction, relationships within groups of variables were greater than those between groups.

Teacher Questionnaire

Reliability coefficients for five scales of problem solving activities were estimated using the alpha coefficient (N=89). Reliability coefficients were: coordination (COORD, .86), adaptation (ADAPT, .83), resource allocation (RES, .75), level of strain (STRESS, .69), and integration (INTEG, .29). The low reliability for the scale integration (INTEG) is of concern and may be related to the small number of items in the scale. Reliability does not improve by deleting any of the three items. Georgopoulos (1986) indicated that the results in the area of integration were the weakest. Evidence of validity is discussed later since interrelationships among problem solving variables are expected in the model.

Testing the Model

In this section, the results for variables which were expected to be related to problem solving, educational efficiency, achievement, and student satisfaction are presented for each cluster of relationships identified earlier in the Model of Organizational Effectiveness Adapted for Co-operative Education.

Variables Related to Problem Solving

It was felt that the measures of problem solving would be *interrelated* and that *student inputs* and *structure* variables would relate to **Problem Solving** activities of the co-operative education staff.

Descriptive statistics for problem solving scales are provided in Table 8. In general, all mean item scores were substantially higher than the mid-point. Teacher perceptions of problem solving in their departments were fairly high. The highest mean item scores were found for integration (INTEG), coordination (COORD), and level of strain (STRESS). Teachers felt loyal and committed to their schools and co-operative education programs, appreciated by administration, positive about their ability to coordinate

work tasks, and overall, experienced little tension in their interactions with individuals and groups in the school and in the external environment. The mean item scores were similar for adaptation (ADAPT) and resource allocation (RES). Teacher perceptions were less positive about their ability to meet employer and community expectations, collaborate for relevant services, establish satisfactory contacts with external groups, acquire sufficient resources needed to provide high quality service to students, and receive necessary school services and support when requested.

Table 8

Descriptive Statistics for Problem Solving Scales (N=21)

	No. of Items	Possible Range	Mean	SD	Mean Item Score
Problem Solving					
INTEG	3	3-15	12.01	.84	4.00
COORD	7	7-35	26.84	2.89	3.83
STRESS	9	9-45	34.37	1.82	3.82
ADAPT	17	17-85	58.29	4.48	3.43
RES	10	10-50	34.14	2.76	3.41

Relationships Among Problem Solving Scales

Relationships were expected among the problem solving scales (see Table 9). For the sample size of N=21 (number of schools), it should be noted that a less restricted level of significance ($\alpha = .05$) was selected. The mean correlation coefficients ranged from .16 to .52. The highest mean coefficient was found for coordination (COORD). Overall, 27% of the overall variance in problem solving was explained by coordination. The mean coefficients were somewhat similar for two measures resource allocation (RES) and adaptation (ADAPT). The lowest mean correlations were found for integration (INTEG) and strain (STRESS). Teacher perceptions of integration (INTEG) and level of strain (STRESS) tended to show low correlations with all variables except coordination of work tasks and activities (COORD). The low reliability of the scale INTEG might, in part, account for this.

Table 9

Correlations Among Problem Solving Scales (N=21)

	Problem Solving				
	COORD	INTEG	STRESS	ADAPT	RES
INTEG	.51*				
STRESS	.37*	.04			
ADAPT	.66*	.10	.09		
RES	.55*	.27	.15	.36	
Mean	.52	.23	.16	.30	.33

*p< .05

Not surprisingly, the perceptions of the staff in regard to their ability to coordinate the co-operative education tasks and activities (COORD) was most highly and significantly related not only to the external environment in terms of meeting expectations, satisfactory relationships, and collaboration with others (ADAPT), but also to the acquisition and satisfaction with resources (RES), their feelings of appreciation and commitment to the school and program (INTEG), and finally, to the amount of tension experienced among participants (STRESS). No other relationships were significant; however, the low sample size with correlations based on mean school scores required large values to be significant. The values observed in this study are likely more stable than appears as they are based on responses of 89 staff members. Despite the general lack of significant relationships for four problem solving scales, the correlation was in the direction expected in every case. While it may be risky to suggest there might be relationships, the percent of variance explained based on the mean correlation is worth noting, particularly for resource allocation (RES, 10.89%), adaptation (ADAPT, 9.00%), and integration (INTEG, 5.29%).

Student Inputs and Problem Solving

When students get involved in co-operative education, they already possess certain characteristics which may relate to the problem solving activities of the staff who administer and deliver co-operative education. Therefore, it was of interest to determine the extent to which student inputs related to problem solving. Pearson product moment correlation coefficients for student input variables with measures of problem solving are reported in Table 10.

Table 10

Correlation Coefficients for Student Input Variables with Problem Solving Scales (N=21)

Inputs	Problem Solving				
	COORD	INTEG	STRESS	ADAPT	RES
PRE-ACH	.40*	-.19	.06	.34	-.04
LEVEL	.20	.40*	.13	.28	.18
MOT	-.13	-.05	-.14	-.23	.20
REAS	-.31	-.04	.43*	-.36	.06
PART	.42*	.33	.19	.40*	.14
VOL	.15	.46*	-.09	.14	-.11

* $p < .05$

Correlation coefficients of six student inputs with five scales of problem solving ranged from -.36 to .46. Very few relationships were significant. This was understandable given the stringent sample size (N=21). Only coefficients greater than 1.361 were significant. The highest relationship was found between volunteer work experience (VOL) and integration (INTEG). Interestingly, when co-operative education students had volunteer work experience, staff feelings of loyalty and commitment to their school and co-operative education program and appreciation by administration were greater. Perhaps there is a special quality found in young people who give their time freely to serve others which, in turn, relates to staff perceptions of integration in regard to feelings of loyalty and commitment and appreciation by administration. In general, while involvement of students in part-time work was most consistently related to staff perceptions of their ability to solve problems, PART was significantly related to coordination (COORD) and adaptation (ADAPT). If students in co-operative education had part-time work experience, then staff felt more positive about their ability to coordinate work tasks and adapt to the external environment. Somewhat similar relationships were found between reason for participating (REAS) and the level of strain (STRESS), level of study (LEVEL) and integration (INTEG), and pre-achievement (PRE-ACH) and coordination (COORD). In this study, if students selected co-operative education for career-related reasons rather than academic reasons, then staff perceptions of the amount of stress experienced with various groups (internal and external) were lower. When the students in co-operative education had higher levels of study (Basic, General, Advanced), staff perceptions of loyalty and commitment to

their schools and programs also tended to be higher. Likewise, the greater student achievement at the time of entry into co-operative education then the higher staff perceptions were of their ability to coordinate work tasks. Only one student input, motivation (MOT), did not relate significantly to any of the problem solving activities. Surprisingly, one would have thought that the extent of student motivation to take co-operative education would relate to how well staff solve problems as they administer and deliver co-operative education. While there were only six significant relationships among the variables, it is important to point out the contribution in regard to the percent of variance accounted for. For each of these relationships, the percent of variance explained was over 16%.

It would appear that all student inputs, except motivation relate to certain problem solving activities. Three problem solving activities which appeared to be most related to student inputs included adaptation to the external environment (ADAPT), coordination of work tasks and activities (COORD), and feelings of integration (INTEG). Staff perceptions of the sufficiency of resources needed to provide high quality service to students or their satisfaction with internal services and support (RES) were not significantly related to any of the student inputs.

Structure and Problem Solving

Structure variables of the school and co-operative education program were also expected to relate to the problem solving activities of the staff who administer and deliver co-operative education. Ordinarily, one might have used MANOVA for data analysis. However, because of the small sample size ($N=21$) and the exploratory nature of the research, analyses of variance (ANOVAS) were used. When ANOVA was significant, post hoc analyses were done using Scheffe's statistic to determine which groups were significantly different. Results for each structure variable are presented below.

Location of school (LOC). Significant differences were found between urban and rural schools for the problem solving activity of integration (INTEG ($F(1,19)=9.17$)). No significant differences were found among groups for coordination (COORD), level of strain (STRESS), adaptation to the external environment (ADAPT), and resource allocation (RES).

Staff perceptions of loyalty and commitment to their schools and co-operative education programs as well as their sense of appreciation by administration were higher in rural locations (12.66) than the perceptions of staff in urban locations (11.58). One had

expected that rural schools would be more conducive to a family like atmosphere which, in turn, would promote higher integration.

Population of school (SIZE). Significant differences were found between smaller and larger schools for the problem solving activity, adaptation to the external environment (ADAPT ($F(1,19)=4.65$)). No significant differences were found for coordination, integration, level of strain, and resource allocation.

Staff perceptions of their ability to adapt to the external environment were higher in schools with 1000 or fewer students (59.11) than staff perceptions in larger schools (54.32). In this study, staff from the smaller schools tended to be more positive about relationships with the community, collaboration with other schools and organizations, and contacts with various external groups. It was surprising that school size did not relate more to other problem solving activities, particularly in regard to the sufficiency of resources (RES). However, since the majority of schools involved in this study was considered fairly large, it may be that the sample did not accurately represent truly small schools.

Maturity of co-op program (MAT). Significant differences were also found among groups for the problem solving activity adaptation to the external environment (ADAPT ($F(1,19)=5.74$)). No significant effects were found for coordination, integration, level of strain, and resource allocation. Means and standard deviations are reported in Table 11.

As expected, staff perceptions in the most mature co-operative education programs were significantly different than staff perceptions in the least mature programs. Staff in the most mature programs had higher perceptions of adaptation in regard to relations with the community, collaboration with others, and satisfaction with contacts than staff in the least mature programs. However, it was surprising that maturity of co-operative education programs did not relate to other problem solving activities as well.

Table 11

Means and Standard Deviations for Adaptation by Maturity of Program (N=21)

Scale	Maturity*					
	Five or less		Six to nine		Ten or more	
	years		years		years	
	<u>n</u> =5		<u>n</u> =8		<u>n</u> =8	
	M	SD	M	SD	M	SD
Adaptation	52.56	3.89	58.28	4.87	60.45	3.37

* $p < .05$

Number of students involved in co-operative education (STUD). For the variable STUD, significant differences were found among groups for adaptation (ADAPT ($F(1,19)=4.57$)). No significant differences were found for coordination, integration, level of strain, and resource allocation. Means and standard deviations are reported in Table 12.

Table 12

Means and Standard Deviations for Adaptation by Number of Students (N=21)

Scale	Number of Students*					
	Less than 76		76 to 125		More than 125	
	<u>n</u> =6		<u>n</u> =10		<u>n</u> =5	
	M	SD	M	SD	M	SD
Adaptation	49.65	3.75	57.41	5.09	59.66	3.51

* $p < .05$

For adaptation to the external environment (ADAPT), teachers in schools with the largest numbers of students involved in co-operative education differed statistically from those in programs with the smallest number of students involved. Staff perceptions of

relations with the community, collaboration for services, and satisfaction with external contacts were higher in the largest programs than staff perceptions in the smaller programs.

Number of teachers involved in co-operative education (TEACH). No significant effects were found for any problem solving activity. The number of teachers involved in co-operative education was expected to relate to the problem solving activities of the department. While it was thought that coordination of work tasks and activities would be easier and feelings of loyalty and commitment higher with smaller numbers, it was also expected that adaptation to the external environment and resource allocation might be more satisfactory with larger numbers of teachers. It was also interesting that the amount of stress was not related to the number of teachers involved.

In summary, all structure variables, except the number of teachers (TEACH), explained differences in staff perceptions of certain problem solving activities. The problem solving activity which was most related to structure was adaptation to the external environment (ADAPT). The maturity of co-operative education programs (MAT), size of school (SIZE), and number of students involved (STUD) related to differences in staff perceptions of their ability to adapt to the external environment. In programs which were the most mature and had the largest number of students involved in co-operative education, staff perceptions of their ability to adapt to the external environment were highest. The reverse was found for SIZE. When the population of the school was smaller, staff perceptions of their ability to adapt to the external environment were higher. Location of the school (LOC) was related to staff perceptions of integration. In rural schools, staff felt more appreciated by administration and had greater feelings of loyalty and commitment to their schools and programs (INTEG). Three problem solving activities coordination of work tasks and activities (COORD), level of strain (STRESS), and resource allocation (RES) were not significantly related to any structure variable.

Variables Related to Educational Efficiency

From the model, it was expected that *student inputs*, *problem solving* activities, and *structure* variables would relate to **Educational Efficiency**. Results for each of the above are presented below.

Student Inputs and Educational Efficiency

For the assessment of the effects of student inputs on measures of educational efficiency, Hierarchical Linear Model (HLM) analyses were done. However, before presenting the HLM results, it is important to provide some information about student inputs.

In this study, achievement of students at the time of entry into co-operative education (PRE-ACH) was probably slightly higher than average. Twenty-two percent of students reported marks between 80 to 100. A larger number, 44%, reported marks from 70 to 79, 29% of the students were achieving marks from 60-69, 4% had marks in the 50's, and only 1% of the students did not have passing marks. Only 4% of this group had marks in the 50's and less than 1% of the students were not passing. This trend of high achieving students participating in co-operative education programs is consistent with the research reported earlier (Cheng, 1990; Thibault, 1991). For level of study (LEVEL), 52% of students were taking their courses at the advanced level, 42% at the general level, and 6% at the basic level. Similar results were also reported by Cheng (1990). The majority of students (69%) were highly motivated (MOT) to participate in co-operative education. An overwhelming majority of students (82%) selected co-operative education for career-related reasons rather than academic reasons (REAS). As well, most students had part-time work experience (PART, 88%) while slightly less than half had volunteer work experience (VOL, 47%).

Information on student perceptions of educational efficiency is also of interest. Descriptive statistics for each scale of educational efficiency used in the HLM analyses are shown in Table 13. These descriptive statistics are for the sample of 648 students.

In each case, the mean item scores for the scales of educational efficiency were above the middle value. Overall, students had positive perceptions of educational efficiency for all seven areas. However, there were some differences which are worth noting. It was reassuring that students were most positive about their job placement (JOB). For two scales, student perceptions were not as high as JOB, however, they were quite positive about the counselling they received for co-operative education (COUN) and preparation for the workplace (PREP). Students in this study were least positive about the visits made to the workplace (VISIT), the related subject (SUB), and the evaluation process (EVAL). Student perceptions of the classroom integration activities (CLASS) while overall favorable, were not as high as student perceptions for JOB, COUN, and PREP nor were they as low for VISIT, SUB, and EVAL.

Table 13

Descriptive Statistics for Scales of Educational Efficiency (N=648)

	No. of Items	Possible Range	Mean	SD	Mean Item Score
Educational Efficiency					
Job placement	6	6-30	23.33	4.60	3.89
Counselling for co-op	5	5-25	18.86	2.89	3.78
Preparation for work	5	5-25	18.84	2.96	3.77
Classroom activities	6	6-30	19.54	4.15	3.50
Visits to the workplace	8	8-40	26.63	6.48	3.26
Related subject	5	5-25	16.24	3.45	3.25
Evaluation activities	7	7-35	22.65	5.03	3.24

A summary of the results for HLM analyses for the effects of *student inputs* with each of the seven scales of *educational efficiency* are reported in Table 14. (For readers interested in the detailed analysis for each scale of educational efficiency see Appendix D, Tables D-1 to D-7). The models reported in all tables are final models. Variables that did not reach statistical significance in a first round analysis were trimmed from the models and the models were then re-estimated. For each outcome of educational efficiency, the proportion of between-schools variance was negligible. Schools in this study did not appear to make a difference.

Student input variables MOT and VOL accounted for approximately 6.6% of the within-schools variance of the scale COUN. The more highly motivated students are to take co-operative education the greater student perceptions of the quality of care received during the counselling process. Similarly, students with volunteer experience also tended to feel more positive about the counselling process.

Just under 5% of the within-schools variance in SUB was explained by PRE-ACH, MOT, and REAS. Students with high achievement, greater motivation, and an academic reason for participating had more positive perceptions about the consonance of their related subject.

Table 14

HLM Coefficients for Student Inputs Significantly Related to Educational Efficiency and Percent of Variance Explained (N=648)

Inputs	Educational Efficiency						
	COUN	SUB	PREP	JOB	CLASS	VISIT	EVAL
PRE-ACH	-	.47	-	-	-	-	.73
LEVEL	-	-	-	-	-	-1.16	-.93
MOT	1.43	.94	1.30	2.11	.90	-	-
REAS	-	-.20	-	-	-.24	-.30	-
PART	-	-	-	-	-	-	-
VOL	.62	-	-	1.19	.77	1.75	.93
% Variance	6.55	4.80	5.27	5.98	3.58	3.33	2.41

One student input, MOT, had a significant effect on PREP and explained slightly more than 5% of the within-schools variance. The more motivated students were more positive in their perceptions of how adequately they felt prepared for the workplace.

Approximately six percent of the within-school variance of JOB was explained by two student inputs, MOT and VOL. High motivation to take co-operative education and involvement in volunteer work contributed to higher feelings of consonance in their jobs.

MOT, REAS, and VOL accounted for approximately 4% of the within-schools variance in CLASS. In this study, students with high motivation, an academic reason (rather than career-related reason) for participating in co-operative education, and volunteer experience had more positive feelings about the efficiency of classroom integration activities.

LEVEL, REAS, and VOL had statistically significant effects on VISIT and explained 3.3% of the variance within-schools. In this case, students who were taking courses at lower levels of study, had selected an academic reason for participating in co-operative education, and had volunteer experience were more positive about the quality of care they received during the visits to the workplace.

Approximately 2.5% of the within-schools variance of EVAL was accounted for by PRE-ACH, LEVEL, and VOL. Students who were higher achievers prior to entry into co-operative education, registered in lower levels of study, and involved in volunteer

experience had more positive feelings about the educational efficiency of the evaluation process.

In general, the combined affects of *student inputs* explained approximately two to seven percent of the within-schools variance in student perceptions of educational efficiency. Two student inputs, motivation (MOT) and volunteer work experience (VOL), were part of the final model for five of seven measures of educational efficiency. The students who were more highly motivated to take co-operative education and involved in volunteer work tended to have more positive perceptions of educational efficiency. REAS was related to three measures of educational efficiency. Interestingly, in each case, students who selected academic reasons for participating in co-operative education over career related reasons had greater perceptions of educational efficiency. LEVEL related to two measures, and in both situations students in lower levels of study tended to have greater perceptions of educational efficiency than students in higher levels of study. Only part-time work experience (PART) did not account for any of the variance in student perceptions of educational efficiency. Student inputs were most highly related to student perceptions of counselling (COUN) and the job placement (JOB). Interestingly, the same two inputs, motivation (MOT) and volunteer work experience (VOL), explained the variance in student perceptions for these two scales. The measure of educational efficiency least related to student inputs was EVAL. Overall, it would appear that student inputs do explain some of the variance in student perceptions of educational efficiency.

The following results showing relationships among *problem solving* activities and measures of *educational efficiency* provide additional information.

Problem Solving and Educational Efficiency

The ability of the staff to solve problems was also expected to relate to student perceptions of educational efficiency. Pearson product moment correlations of the five *problem solving* variables (coordination (COORD), integration (INTEG), level of strain (STRESS), adaptation (ADAPT), resource allocation (RES)) with the seven scales of *educational efficiency* (counselling (COUN), related subject (SUB), preparation for work (PREP), job placement (JOB), classroom integration activities (CLASS), visits to the workplace (VISIT), evaluation activities (EVAL)) are reported in Table 15.

Overall, the mean correlation coefficients of problem solving with educational efficiency were very low ranging from -.07 to .25. The highest mean coefficients were found for resource allocation (RES, .25) and coordination (COORD, .21). The mean correlation coefficient indicates that overall, RES accounted for 6.25% of the variance in educational efficiency and COORD accounted for 4% of the variance. The mean correlation

coefficients for all others were at or below .11. The lowest relationship was found for integration (INTEG, .04).

Table 15

Correlation Coefficients for Scales of Problem Solving with Educational Efficiency (N=21)

Scale	Educational Efficiency							Mean
	COUN	SUB	PREP	JOB	CLASS	VISIT	EVAL	
COORD	.32	.28	.40*	-.04	-.08	.22	.34	.21
INTEG	.07	.14	.08	-.03	-.04	-.01	.07	.04
STRESS	.18	-.04	.29	.04	-.12	.16	.26	.11
ADAPT	.06	.05	.17	-.26	-.19	-.24	-.05	-.07
RES	.46*	.25	.23	.09	.37*	.24	.11	.25
Mean	.22	.14	.28	.04	.13	.07	.15	

* $p < .05$

In general, the correlation coefficients among all measures were not as high as expected, ranging -.26 to .46. Only three relationships were significant (greater than 1.36). The highest relationship was found between RES and COUN, .46 (21% of variance). Staff perceptions of the sufficiency of resources and satisfaction with services was related to student perceptions of the quality of care they received in the counselling process. Similar relationships were also found between RES and CLASS, .37 (14% of variance) and COORD and PREP, .40 (16% of variance). Staff perceptions of the sufficiency of resources and satisfaction with services was also related to the efficiency of the classroom integration activities. As well, perceptions of the staff in regard to their ability to coordinate work tasks was related to student perceptions of how well they were prepared for the workplace. Three problem solving activities integration (INTEG), level of strain (STRESS), and adaptation (ADAPT) were not significantly related to any measure of educational efficiency. The two scales of educational efficiency which appeared to be most associated overall to problem solving were preparation for work (PREP, .28) and counselling (COUN, .22). The measure of educational efficiency least related overall to problem solving was the job placement (JOB). It would appear that the ability of the staff to solve problems has little relationship to what happens to students on the job. Not surprisingly, the school has little control over the workplace.

In general, it was expected that the relationships among measures of problem solving and educational efficiency would have been much higher. There are several reasons which might explain these results. First, relationships between individual teachers and students are not included in the assessment of problem solving. It is likely that the individual teacher effect would have a greater impact. Second, low reliability, particularly with the scale INTEG, probably limited the extent of relationships. Finally, the small sample size ($N=21$) required coefficients greater than .36. More significant relationships may have been evident with a larger sample of schools. Despite the low number of significant relationships, it is interesting that they did account for sizeable amounts of variance in educational efficiency. If the other non significant correlations would remain as high as shown with a larger number of schools, considerable more variance would be explained.

Results for the relationships among *structure* and *educational efficiency* are presented below.

Structure and Educational Efficiency

Student perceptions of educational efficiency were also expected to be related to structure variables. Results are presented below for the three structure variables that had significant MANOVA effects. No significant MANOVA effects were noted for SIZE and LOC.

Maturity of co-operative education programs (MAT). Maturity of the co-operative education program (MAT) produced multivariate effects (Wilk's Lambda= .95). Surprisingly, however, no significant differences were found for any of the univariate ANOVAS. In this study, three levels of maturity were identified for analyses, programs that had been established for five years or less, between six and nine years, and ten years or more. Categories were considered appropriate based on the number of schools in each.

Number of students involved in co-operative education (STUD). STUD was significantly related to educational efficiency (Wilk's Lambda= .94). Significant univariate effects were found among groups for visits to the workplace (VISIT ($F(2,645)=6.48$) and evaluation activities (EVAL ($F(2,645)=8.36$)). No significant differences were found for counselling, related subject, preparation for the workplace, job placement, and classroom integration activities. Means and standard deviations are reported in Table 16.

Table 16

Means and Standard Deviations for Visits to the Workplace and Evaluation Activities by Number of Students (N=648)

Variable	Number of Students**					
	Less than 76		76 thru 125		More than 125	
	n=142 (6 schools)		n=343 (10 schools)		n=163 (5 schools)	
	M	SD	M	SD	M	SD
Visits to the workplace	27.60	5.69	25.77	6.57	27.59	6.72
Evaluation activities	22.59	4.84	22.05	4.84	23.98	5.33

**p< .01

Students in co-operative education programs with 76 to 125 students were less positive about the visits to the workplace (VISIT) than students in the other two groups. Students from the medium-sized co-operative education programs were less positive about the evaluation activities (EVAL) than students in the largest program. The low scores for this middle group are difficult to explain. It may be that the uniqueness of the specific schools in the sample in regard to teaching methodology, administrative style, or student personalities had an effect.

Number of teachers involved in co-operative education (TEACH). MANOVA results were significant for the structure variable TEACH (Wilk's Lambda= .94). In the follow-up analyses of variances, significant differences were noted for three scales of educational efficiency, classroom integration activities (CLASS ($F(2,645)=5.66$)), visits to the workplace (VISIT ($F(2,645)=10.92$)), and evaluation activities (EVAL ($F(2,645)=7.97$)). No significant differences were found for counselling (COUN), related subject (SUB), preparation for work (PREP), and job placement (JOB). Means and standard deviations are reported in Table 17.

Table 17

Means and Standard Deviations for Classroom Activities, Visits to the Workplace, and Evaluation Activities by Number of Teachers (N=648)

Variable	Number of Teachers**					
	Two or three		Four or five		More than five	
	<u>n</u> =357 (12 schools)		<u>n</u> =167 (5 schools)		<u>n</u> =124 (4 schools)	
	M	SD	M	SD	M	SD
Classroom activities	19.39	4.05	19.08	4.53	22.78	4.75
Visits to the workplace	26.78	6.47	24.95	6.52	21.51	5.80
Evaluation activities	22.78	4.75	28.45	5.93	23.82	4.36

** $p < .01$

Students in programs with more than five teachers involved in co-operative education perceived the activities to be more interesting and more meaningful than students in the other two groups. It may be that when more teachers are involved there is more time to prepare the classroom activities. Students tended to be more positive about the visitation process as the number of teachers involved in the programs decreased. One would tend to expect more teachers involved to increase the frequency and quality of interaction during the visits. For evaluation activities, the middle group was significantly higher in their perceptions of the evaluation process than students from the other two groups. There was no pattern to suggest that smaller or larger numbers of teachers explained differences in educational efficiency. Depending on the scale of educational efficiency, the number of teachers related to student perceptions quite differently.

Overall, STUD and TEACH were related to various scales of educational efficiency. The number of students involved in co-operative education (STUD) accounted for differences in student perceptions of visits to the workplace (VISIT) and evaluation activities (EVAL). Students in mid-sized programs were less positive about the visits to the workplace than students in smaller or larger programs. Student perceptions of the evaluation activities were also lower in the mid-sized program than those in programs with

the largest numbers of students involved. The number of teachers (TEACH) accounted for different student perceptions of the classroom integration activities (CLASS), visits to the workplace (VISIT), and evaluation activities (EVAL). No particular pattern was evident to support greater perceptions of educational efficiency with smaller or larger numbers of teachers involved. While maturity of co-operative education programs (MAT) had an overall significant MANOVA effect, the differences between pairs did not significantly affect any scale of educational efficiency. The population of the school (SIZE) and location of the school (LOC) did not relate to educational efficiency.

Results for the third set of relationships, variables that relate to achievement, are presented below.

Variables Related to Achievement

It was expected that *student inputs*, *educational efficiency*, and *structure* variables would relate to **Achievement** of co-operative education students at the end of their program. HLM analyses were used to assess first, the relationships between measures of student inputs and post-achievement, and second, the relationships between scales of educational efficiency and post-achievement. Analysis of variance was used to determine if achievement of students differed among groups for the five structure variables.

Student Inputs and Achievement

Results of HLM analyses are reported in Table 18. Between-schools variance in achievement was minimal. The schools did not contribute significantly to differences in student achievement. However, PRE-ACH and LEVEL explained just under 45% of the within-schools variance in POST-ACH. Not surprisingly, students who were higher achievers at the time of entry into co-operative education and taking courses at higher levels of study are likely to have higher achievement at the end of the program.

Table 18

Coefficients, Standard Errors, Variance Within-Schools, Between-Schools, and Percent of Variance Explained for Effects of Student Inputs on Achievement (N=648)

Unconditional model				
Within-schools variance	70.94			
Between-schools variance	5.58			
		Coefficient	SE	t
Conditional model				
Base		74.996*	.623	120.271
PRE-ACH		7.184*	.358	20.089
LEVEL		2.018*	.455	4.433
MOT		n.s.		
REAS		n.s.		
PART		n.s.		
VOL		n.s.		
Within-schools variance	39.24			
Between-schools variance	6.73			
Percentage within-schools variance explained	44.68			

*p< .05

Educational Efficiency and Achievement

Results of HLM analyses for effects of educational efficiency on achievement are reported in Table 19.

Table 19

Coefficients, Standard Errors, Variance Within-Schools, Between-Schools, and Percent Variance Explained for Effects of Educational Efficiency on Achievement (N=648)

Unconditional model			
Within-schools variance	70.94		
Between-schools variance	5.58		
		Coefficient	SE t
Conditional model			
Base		74.959*	.622 120.581
COUN		n.s.	
SUB		.528*	.099 5.349
PREP		n.s.	
JOB		n.s.	
CLASS		n.s.	
VISIT		n.s.	
EVAL		n.s.	
Within-schools variance	67.87		
Between-schools variance	5.69		
Percentage within-schools variance explained	4.33		

* $p < .05$

One scale of educational efficiency, SUB, explained slightly more than 4% of the within-schools variance in achievement at the end of the co-operative education program. While not as high as one may have liked, student perceptions of greater consonance in the related subject did contribute to higher achievement. It would seem to make sense that achievement of students at the end of the co-operative education program is, in part, a result of what happens in the related subject (SUB). As the main in-school academic component of the co-operative education program, SUB is logically, the scale most directly related to achievement.

In general, while the effects are not necessarily additive, two student inputs (PRE-ACH, LEVEL) and one scale of educational efficiency (SUB) explained a substantial

amount of the variance in post-achievement. While it appears that achievement at the time of entry is a useful predictor of achievement at the end, co-operative education is about other things as well. It would be important to consider outcomes, apart from achievement, that may be highly beneficial. As well, one should exercise caution in drawing conclusions based on these results since pre-achievement (PRE-ACH) and post-achievement (POST-ACH) were self-reported measures. This fact may have contributed to the large effect.

Structure and Achievement

In this study, no significant effects were found overall for any of the structure variables. While not totally surprising, one had thought that structure, particularly, the number of students and teachers involved in a co-operative education program, might account for differences in student achievement.

The next set of relationships tested includes variables affecting student satisfaction.

Variables Related to Student Satisfaction

It was felt that *student inputs*, *educational efficiency*, and *structure* variables would relate to **Student Satisfaction**.

HLM analyses were used to determine if student inputs and measures of educational efficiency explained a significant portion of the between-and-within-schools variance in student perceptions of satisfaction. As before, the between-schools variance was negligible. Schools did not make a significant difference in student perceptions of satisfaction. Descriptive statistics for measures of student satisfaction are reported in Table 20. Descriptive statistics for measures of student inputs were provided earlier in Table 13.

In general, all means for measures of student satisfaction were higher than the middle value. Students overall expressed a fairly high level of satisfaction for the co-operative education program. For the seven measures corresponding to scales of educational efficiency (SJOB to SCLASS), student satisfaction in regard to the overall quality of service provided by the school was perceived by the majority of students to be very good or excellent for five scales. Student satisfaction was highest for the job placement (SJOB) and preparation for work (SPREP). To a lesser extent, the majority of students were also satisfied with the evaluation of their co-operative education experience (SEVAL), visits to the workplace (SVISIT), and the suitability of the related subject (SSUB). Students were least satisfied overall with counselling for co-operative education

(SCOUN) and the classroom integration activities (SCLASS). It was interesting that both of these areas were primarily in-school activities.

Table 20

Descriptive Statistics for Measures of Student Satisfaction (N=648)

Measure	Possible Range	Mean	SD
SJOB	1-5	3.94	1.01
SPREP	1-5	3.92	.98
SEVAL	1-5	3.77	1.05
SVISIT	1-5	3.67	1.08
SSUB	1-5	3.60	1.09
SCOUN	1-5	3.37	1.10
SCLASS	1-5	3.25	1.22
STELL	0-2	1.67	.56
SNEED	1-5	4.14	.94
SBEN	1-4	3.16	.85
SQC	1-4	3.05	.87

For the measures STELL to SQC, the means indicated that the majority of students would recommend co-operative education to a friend (STELL), felt their needs, based on why they chose to take co-operative education, were met (SNEED), benefitted from co-operative education (SBEN), and felt the school had provided a high level of care (SQC).

Student Inputs and Satisfaction

A summary of the results of HLM analyses for effects of student inputs on student satisfaction is presented in Table 21. Detailed tables for each measure of student satisfaction are included in Appendix E, Tables E1 to E11

Table 21

HLM Coefficients of Student Inputs Significantly Related to Measures of Student Satisfaction and Percent of Variance Explained (N=648).

Measure	Student Inputs						% Variance
	PRE-ACH	LEVEL	MOT	REAS	PART	VOL	
SCOUN		-	.301	-	-	-	1.56
SSUB		-	.356	-	-	-	3.11
SPREP	.154	-.129	.347	-	-	-	4.01
SJOB	.166	-	.282	-	-	-	3.08
SCLASS	-	-.315	-	-	-	-	2.19
SVISIT	-	-.263	-	-	-	-	1.95
SEVAL	-	-.147	.268	-	-	-	1.78
SNEED	.134	-	.514	-	-	-	7.82
SBEN	-	-	.294	-.041	-	-	3.59
STELL	-	-	.316	-.032	-	-	9.47
SQC	.217	-	.273	-	-	-	6.05

One input, MOT, explained 1.6% of the within-schools variance in SCOUN. High motivation to take co-operative education related to greater satisfaction with the quality of service during the counselling process.

Just over 3 % of the within-schools variance for SSUB was accounted for by MOT. Students with high motivation to take co-operative education were likely to be more satisfied with the related subject

PRE-ACH, LEVEL, and MOT explained 4% of the variance within-schools for SPREP. In this study, students with high achievement, in courses at lower levels of study, and those who were more highly motivated to participate in co-operative education tended to feel more satisfied with the preparation for the workplace.

PRE-ACH and MOT explained 3% of the within-schools variance in SJOB. Some variance in student satisfaction with their jobs is accounted for, again, by achievement and motivation to participate in co-operative education. Students with high achievement and

those who were more highly motivated tended to feel more satisfied with the suitability of the work placement.

Two percent of the within-school variance in SCLASS was explained by LEVEL. In this case, the lower the level of study, the more satisfied students were with the classroom activities to link study and work.

LEVEL accounted for just under 2% of the within-school variance in SVISIT. The lower the level of study, the more satisfied students were with the visits to the workplace.

LEVEL and MOT explained approximately 2% of the within-school variance for SEVAL. The lower the level of study and the higher the motivation to take co-operative education resulted in students who were more satisfied with the evaluation of the co-operative education experience.

Nearly 8% of the variance in SNEED was explained by MOT (.514) and PRE-ACH (.134). Student satisfaction with how well the program met their needs was greater when motivation to take co-operative education and achievement were higher.

Approximately 3.5% of the variance in SBEN was explained by MOT and REAS. When motivation was higher and the reason for taking co-operative education was academic, student perceptions of how much they benefitted from the program tended to be higher as well.

Nine percent of within-school variance for STELL was explained by MOT and REAS. Students were more likely to recommend co-operative education to a friend if motivation was high and the reason for participating was academic rather than career-related.

PRE-ACH and MOT explained 6% of the variance within-school in SQC. High achievement at the time of entry into co-operative education and high motivation were related to higher perceptions of the overall quality of care received from the school while in the co-operative education program.

In general, the effects of *student inputs* helped to explain from two to nine percent of the within-school variance for measures of *student satisfaction*. The highest percentages of variance explained were found for three measures of student satisfaction related to whether students would recommend co-operative education to a friend (STELL), the extent the program met their needs (SNEED), and their perceptions of the overall quality of care received from the school (SQC). The input which most consistently related to measures of student satisfaction was motivation to participate in co-operative education (MOT). To a much lesser extent, level of study (LEVEL), reason for participating (REAS), and achievement at the time of entry into the program (PRE-ACH) were also

related. Two inputs, part-time work experience (PART) and volunteer work experience (VOL) did not relate significantly to any of the eleven measures of student satisfaction.

The results of HLM analyses for relationships among scales of educational efficiency and measures of student satisfaction presented below provide additional information for understanding variance in student satisfaction.

Educational Efficiency and Satisfaction

The within-school variables of educational efficiency were analyzed in terms of accounting for the variance in each of the eleven dependent variables of student satisfaction. A summary of these results are presented in Table 22. For more detailed tables see Appendix F, Tables F1 to F11.

Table 22

Summary of Significantly Related Coefficients Among Scales of Educational Efficiency and Measures of Student Satisfaction and Percent of Variance Explained

Measure	Educational Efficiency							% Variance
	COUN	SUB	PREP	JOB	CLASS	VISIT	EVAL	
SCOUN	.057	-	-	-	.050	-	.055	22.22
SSUB	-	.079	-	-	-	-	.064	17.29
SPREP	-	.032	.052	-	-	-	.048	14.34
SJOB	-	-	.067	.062	-	-	.036	24.03
SCLASS	-	.050	-	-	.069	.038	-	19.75
SVISIT	-	-	-	-	-	.054	.045	21.02
SEVAL	-	.037	-	-	-	-	.104	28.00
SNEED	-	-	-	.115	-	-	-	33.57
SBEN	-	-	-	.107	-	-	-	34.00
STELL	.037	-	-	.039	-	-	-	19.65
SQC	.036	-	.029	.019	-	.018	.048	28.74

COUN, CLASS, and EVAL explained 22% of the within-school variance in SCOUN. The higher the perceptions of educational efficiency in the counselling process, classroom integration activities, and evaluation of co-operative education, the more satisfied students felt overall with the counselling process.

SUB and EVAL accounted for over 17% of the variance in SSUB. Students with higher perceptions of educational efficiency in the related subject and evaluation activities tended to be more satisfied overall with their related subject .

SUB, PREP, and EVAL explained just over 14% of the variance in SPREP. Higher student perceptions of educational efficiency in the related course, preparation for the workplace, and evaluation activities resulted in greater student satisfaction overall with their preparation for the workplace.

Approximately 24% of the variance in SJOB was explained by PREP, JOB, and EVAL. Students with higher perceptions of educational efficiency in regard to preparation for work, the job placement, and evaluation activities were more satisfied overall with the suitability of their job placement .

Just under 20% of the within-schools variance in SCLASS was explained by SUB, CLASS, and VISIT. Greater student satisfaction with the activities to link school and work resulted when student perceptions of educational efficiency in the related subject, classroom integration activities, and visits made to the workplace were higher.

VISIT and EVAL accounted for 21% of the variance in SVISIT. It seemed that when student perceptions of educational efficiency in regard to the visits made at the workplace and the evaluation activities were higher, overall student satisfaction with the school visits also tended to be higher.

Twenty-eight percent of the variance in SEVAL was accounted for by SUB and EVAL. The higher the educational efficiency in the related subject and evaluation activities the more satisfied students were likely to be with the evaluation of their co-operative education experiences.

One measure of educational efficiency, JOB, explained 34% of the variance in SNEED. The greater student perceptions were of educational efficiency in the job placement, the more satisfied students were with how well the co-operative education program met their needs.

Again, JOB accounted for 34% of the variance in SBEN. It seems that when educational efficiency in the job placement was high that students were more likely to feel they benefitted from co-operative education to a greater extent.

Twenty percent of the within-schools variance in STELL was accounted for by COUN and JOB . When perceptions of educational efficiency in the counselling process and job placement were high, students were more likely to recommend co-operative education to their friends.

Five scales of educational efficiency COUN, PREP, JOB, VISIT, and EVAL explained just under 29% of the variance in SQC. It was not surprising that more scales of

educational efficiency than in the previous results contributed to the variance in student perceptions of the overall quality of care received from the school. In this case, the higher the perceptions of educational efficiency in counselling, preparation for work, job placement, visits to the workplace, and evaluation activities the higher students rated the overall quality of care they received from the school while in co-operative education. It was interesting that SUB and CLASS, which mostly represent the academic portion of the program, did not account for variance in SQC.

In general, the above results for HLM analyses of *educational efficiency* and *student satisfaction* accounted for more variance than the results of the student inputs. The amount of variance accounted for ranged from 14 to 34 percent. This was not surprising; however, it was particularly reassuring that the appropriate scale of educational efficiency (e.g., COUN) was part of the final model for the corresponding measure of student satisfaction (e.g., SCOUN). One expected that student perceptions of educational efficiency in each of the seven areas of the co-operative education program would be reflected in their overall satisfaction with the corresponding area. In looking at the coefficients of educational efficiency with measures of student satisfaction, it was interesting that the coefficients overall, were greatest for job placement (JOB) with extent program met student needs (SNEED), and benefits received (SBEN). Of the seven measures of educational efficiency, evaluation activities (EVAL), in combination with other variables, accounted for variance in the most number of student satisfaction measures (seven). However, job placement (JOB), which related to five measures, was the only scale to explain the greatest amount of variance for any variable. Not surprisingly, it would appear that what happens to students in their job placement is important in determining whether their needs are met and the extent to which they benefit from co-operative education. Student perceptions of the related subject (SUB) in combination with other variables was part of the final model for four measures of student satisfaction. Student perceptions of counselling (COUN), visits to the workplace (VISIT), and preparation for work (PREP) each related to three measures. Classroom integration activities (CLASS) related to two measures. The measures of student satisfaction with the lowest amounts of variance accounted for were satisfaction with preparation for work (SPREP, 14%) and related subject selection (SSUB, 17%). The least amount of variance explained for all other measures was slightly less than 20%.

Further results to determine relationships among *structure* variables and measures of student satisfaction follow.

Structure and Satisfaction

Multivariate analyses of variance (MANOVAS) were used to determine if structure variables explained any significant variance in measures of student satisfaction. When MANOVA was significant, analyses of variance (ANOVAS) were used to determine if there were significant univariate effects. When ANOVA was significant, post hoc analyses (Scheffe's statistic) was used to locate differences among groups. Results are presented below for the four structure variables which yielded significant MANOVA effects. The structure variable maturity of co-operative education program (MAT) did not yield a significant MANOVA result.

Population of school (SIZE). SIZE was a significant factor relating to student satisfaction (Wilk's Lambda= .96). In the follow-up analyses of variance significant differences were found for student satisfaction with the counselling for co-operative education (SCOUN ($F(1,646)=7.39$)), visits to the workplace (SVISIT ($F(1,646)=8.91$)), recommendation of co-operative education to a friend (STELL ($F(1,646)=7.78$)), and overall quality of care received from the school (SQC ($F(1,6646)=7.15$)). Means and standard deviations are reported in Table 23.

Table 23

Means and Standard Deviations for Satisfaction Related to Counselling, Visits to the Workplace, Recommendation to a Friend, and Overall Quality of Care by Size of School (N=648)

Variable	Size of School**			
	Less than 1000		More than 1000	
	n=450		n=198	
	(15 schools)		(6 schools)	
	M	SD	M	SD
Counselling	3.29	1.09	3.55	1.12
Visits to the workplace	3.58	1.11	3.86	.99
Recommendation to a friend	1.63	.60	1.76	.49
Overall quality of care	2.99	.91	3.19	.76

** $p < .01$

For each variable, students in schools with a population greater than 1000 scored higher than students in schools with a population less than 1000. Student perceptions of the overall quality of service in regard to the counselling process, the visits made by teachers to their workplaces, whether they would tell a friend to take co-operative education, and their overall rating of the quality of care received from the school were significantly higher for students in the larger schools. Since one would expect larger schools to have more resources available, it may be that school size also reflects the quantity of resources available for co-operative education. More staff in guidance departments and more teachers assigned to co-operative education may explain why students in the larger schools are more satisfied with the counselling process and visitations at the workplace. In turn, this is likely to influence whether students tell their friends to take co-operative education and how they feel about the program overall. However, since there was no general pattern of differences among groups for any of the other measures of student satisfaction, one cannot make any conclusions from these results without additional information. These findings were not consistent with those found earlier with educational efficiency. SIZE did not account for variation in any measure of educational efficiency.

Location of school (LOC). The variable LOC had a significant effect (Wilk's Lambda= .96). However, significant differences were found among groups for only one measure of student satisfaction, visits to the workplace (SVISIT ($F(1,646)=8.00$)).

Students in urban schools (3.77) rated the overall quality of service in regard to visits at the workplace higher than did students in rural schools (3.53). If one assumes that job placements for students from urban schools are likely closer to their schools than those for rural students, it may be that teachers are able to monitor urban placements more often and for longer periods of time. This might account for the differences between these two groups.

Number of students involved in co-operative education (STUD). MANOVA was significant for the structure variable STUD (Wilk's Lambda= .93). Two measures of student satisfaction showed significant differences among groups, extent program met student needs (SNEED ($F(2,645)=5.81$)) and recommendation of co-operative education to a friend (STELL ($F(2,645)=44.89$)). Means and standard deviations for variables SNEED and STELL by number of students involved in co-operative education are shown in Table 24.

Table 24

Means and Standard Deviations for Measures of Satisfaction Related to Needs Met and Recommendation to a Friend by the Number of Students (N=648)

Variable	Number of Students**					
	Less than 76		76 thru 125		More than 125	
	n=142		n=343		n=163	
	(6 schools)		(10 schools)		(5 schools)	
	M	SD	M	SD	M	SD
Needs met	4.25	.87	4.02	1.02	4.29	.79
Recommendation to a friend	1.72	.55	1.60	.61	1.76	.51

**p< .01

For both variables, students in schools with 76 to 125 students in co-operative education programs were significantly less satisfied than students in schools that had less than 76 students and more than 125 students. Students from the mid-sized programs rated the co-operative education program lower in regard to meeting their needs and whether they would recommend co-operative education to a friend than students in the smallest and largest programs. While one could suggest that the larger co-operative education programs have more resources for which to service students, these results are difficult to understand since students in the smaller programs also scored higher than the middle group. A similar pattern was noted for STUD with two measures of educational efficiency (VISIT, EVAL). Student perceptions in the middle group were again different from student perceptions in both the smaller and larger groups. Students in the middle group scored lower for VISIT and EVAL.

Number of teachers involved in co-operative education (TEACH). The variable TEACH had a significant effect (Wilk's Lambda= .90). In the follow-up analyses of variance, significant differences were found among groups for measures of student satisfaction. These were counselling (SCOUN ($F(2,645)=12.73$)), related subject selection (SSUB ($F(2,644)=8.49$)), preparation for work (SPREP ($F(2,645)=7.96$)), job placement suitability (SJOB ($F(2,645)=5.86$)), classroom integration activities (SCLASS

($F(2,645)=12.50$)), visits to the workplace (SVISIT ($F(2,645)=9.85$)), evaluation activities (SEVAL ($F(2,645)=5.02$)), extent program met student needs (SNEED ($F(2,645)=9.98$)), recommendation of co-operative education to a friend (STELL ($F(2,645)=14.78$)), and overall quality of care (SQC ($F(2,645)=13.91$)). No significant differences were found for the single measure, benefits received (SBEN). Means and standard deviations are reported in Table 25.

Table 25

Means and Standard Deviations for Ten Measures of Student Satisfaction by Number of Teachers (N=648)

Variable	Number of Teachers**					
	Two or three		Four or five		More than five	
	$n=357$		$n=167$		$n=124$	
	(12 schools)		(5 schools)		(4 schools)	
	M	SD	M	SD	M	SD
SCOUN	3.42	1.08	3.04	1.16	3.67	.99
SSUB	3.64	1.05	3.34	1.16	3.85	1.03
SPREP	4.01	.92	3.66	1.05	4.01	.98
SJOB	3.99	.98	3.73	1.12	4.12	.91
SCLASS	3.34	1.14	2.87	1.26	3.52	1.26
SVISIT	3.74	1.06	3.37	1.12	3.88	1.04
SEVAL	3.82	.99	3.56	1.13	3.91	1.05
SNEED	4.22	.87	3.86	1.07	4.26	.88
STELL	1.75	.50	1.45	.68	1.70	.56
SQC	3.11	.84	2.77	.91	3.27	.82

** $p < .01$

For all measures of satisfaction, student perceptions were significantly lower for students in schools where there were four to five teachers involved in co-operative education than those in groups with two to three teachers and more than five teachers. In this study, students in the middle group were less satisfied overall with the counselling they received (SCOUN), selection of the related subject (SSUB), preparation for the workplace (SPREP), suitability of the job placement (SJOB), classroom activities to link study and

work (SCLASS), visits to the workplace (SVISIT), evaluation of the co-operative education experience (SEVAL), how well their needs were met (SNEED), whether they would recommend co-operative education to a friend (STELL), and finally, how they rated the school on overall quality of care (SQC). Since one would have expected lower scores from students in the programs with the smaller number of teachers involved, it is again difficult to make sense of these results.

The pattern found for students in this middle group for ten of the eleven measures of student satisfaction was different from the results found earlier for three scales of educational efficiency (CLASS, VISIT, VALUE). In this case, the number of teachers related differently to each scale. From this study, it appears that students tend to be more satisfied when they are in programs with small or large numbers of teachers involved in co-operative education. It would appear that there are probably other factors which have not been addressed in this study, which may relate to the outcomes as well. It is very likely that a particular combination of teachers, administrators, students, and other factors was present in some of the schools with four to five teachers involved in co-operative education.

Interrelated Outcome Variables

It was expected that relationships would be found between **Achievement** and the **Student Satisfaction** variables.

Pearson product correlations are reported in Table 26. In general, intercorrelations of POST-ACH and student satisfaction measures were very low ranging from .02 to .29. It should be noted however, that all measures, except SCLASS and STELL, were significant. The highest correlations were found for SQC ($r = .29$), SNEED ($r = .20$), and SJOB (.19). Achievement of students at the end of the co-operative education program is related to their ratings of the overall quality of care received from the school while in the co-operative education program and to how well the program met their needs. To a lesser extent, achievement is also related to student satisfaction with the counselling process, related subject, preparation for work, suitability of the job, visits made at the workplace, evaluation process, and how much they benefitted from co-operative education.

A stepwise multiple regression of student satisfaction with the dependent variable post-achievement was conducted. Only one measure of student satisfaction, SQC, made a significant contribution to the variance in post-achievement. The results indicated that only 8% of the variance in achievement at the end of the co-operative education program is predictable from SQC. Student perceptions of the overall quality of care received from the

school explain some variance in student achievement at the end of the program. When students rate the overall quality of care high, it is likely that achievement is also high. The other ten variables of student satisfaction did not significantly account for additional variance in achievement in the multiple regression.

Table 26

Correlation Coefficients for Measures of Student Satisfaction with Achievement (N=648)

Measure	Achievement
	Coefficient
SQC	.29**
SNEED**	.20
SJOB**	.19
SEVAL**	.16
SCOUN**	.15
SBEN**	.14
SPREP**	.14
SSUB**	.13
SVISIT**	.12
STELL	.06
SCLASS	.02

**p< .01

In the next chapter is a discussion of the appropriateness of the Model of Organizational Effectiveness Adapted for Co-operative Education (adapted from Georgopoulos, 1986).

CHAPTER V

THE MODEL FIT

The Model of Organizational Effectiveness Adapted for Co-operative Education was developed with a rationale for including certain variables considered important in understanding organizational effectiveness in co-operative education as a subsystem within the school. In this study, however, not every variable was tested. Therefore, in looking at how well the model fits the expectations, only those variables selected for the study are addressed. The main question to be asked at this point then is, "Was the model relevant?" To answer this question, it is necessary to assess the extent to which certain variables met the expectations from the model. Variables included student inputs, problem solving, structure, educational efficiency, achievement, and student satisfaction. In this section, a summary of relationships among variables is presented for each group. The tables provided in this section highlight relationships which showed significant results based on the particular data analyses used to test relationships.

Student Input Variables

It was expected that student inputs would relate to problem solving, educational efficiency, student satisfaction, and achievement (see Table 27). All student inputs, except MOT, related to certain of the *problem solving* activities. The only problem solving activity which was not affected by any student input was RES. Two student inputs, involvement in part-time work experience (PART) and achievement at the time of entry into co-operative education (PRE-ACH) were related to coordination of work tasks (COORD). PART was also the only input which had a significant relationship with a second problem solving activity, the ability of the staff to adapt to the external environment (ADAPT). Two other inputs, level of study (LEVEL) and volunteer experience (VOL) were related to staff perceptions of loyalty and commitment (INTEG). Finally, the reason why students participate in co-operative education (REAS) was related to the level of tension that staff experienced with others in the school and in the external environment (STRESS). In this case, when students selected co-operative education for career related reasons, staff expressed lower levels of tension. Overall, the highest relationship to problem solving was found for student part-time work experiences (PART).

Table 27

Summary of Significant Relationships for Student Inputs with Problem Solving,
Educational Efficiency, Achievement, and Student Satisfaction

	PRE-ACH	LEVEL	Student MOT	Inputs REAS	PART	VOL
Problem solving						
COORD	*	-	-	-	*	-
INTEG	-	*	-	-	-	*
STRESS	-	-	-	*	-	-
ADAPT	-	-	-	-	*	-
RES	-	-	-	-	-	-
Efficiency						
COUN	-	-	*	-	-	*
SUB	*	-	*	*	-	-
PREP	-	-	*	-	-	-
JOB	-	-	*	-	-	*
CLASS	-	-	*	*	-	*
VISIT	-	*	-	-	-	*
EVAL	*	*	-	-	-	*
Achievement	*	*	-	-	-	-
Satisfaction						
SCOUN	-	-	*	-	-	-
SSUB	-	-	*	-	-	-
SPREP	*	*	*	-	-	-
SJOB	*	-	*	-	-	-
SCLASS	-	*	-	-	-	-
SVISIT	-	*	-	-	-	-
SEVAL	-	*	*	-	-	-
SNEED	*	-	*	-	-	-
SBEN	-	-	*	*	-	-
STELL	-	-	*	*	-	-
SQC	*	-	*	-	-	-

The small sample size used in this study (N=21 schools) may have affected the number of significant relationships. Based on the size of a number of correlations among student inputs and problem solving, one could be somewhat optimistic that more relationships would be significant with a larger number of schools. In addition, problems with reliability for INTEG may explain why more significant relationships were not found.

All student inputs, except part-time work experience (PART), related to student perceptions of *educational efficiency* to some extent. There was no measure of educational efficiency which did not relate, to some degree, to student inputs. Motivation (MOT) and volunteer work experience (VOL) each related to five measures of educational efficiency. Motivation (MOT) was the only input to relate to student perceptions of preparation for the workplace (PREP). Achievement at the time of entry into co-operative education (PRE-ACH), level of study (LEVEL), and reason for participating in co-operative education (REAS) each accounted for variance in two measures of educational efficiency.

A greater relationship emerged among certain student inputs and *post-achievement*. (POST-ACH). Achievement of students prior to entry into co-operative education (PRE-ACH) and their level of study (LEVEL) accounted for 45% of the variance in post-achievement (POST-ACH).

Student satisfaction was also related to student inputs. Four inputs, achievement of students at the time of entry into co-operative education (PRE-ACH), extent of motivation (MOT), level of study (LEVEL), and reason for taking co-operative education (REAS) alone, or in combination, accounted for some of the variance in certain measures of student satisfaction. Two inputs, part-time (PART) and volunteer (VOL) work experience did not contribute in a significant way to variance in any measure of student satisfaction. MOT had the greatest effect on student satisfaction. The extent students were motivated (MOT) explained small amounts of the variance in nine measures of student satisfaction. For two of these measures, satisfaction with counselling (SCOUN) and related subject selection (SSUB), MOT was the only input to contribute to the variance. PRE-ACH and LEVEL both contributed to the variance in four measures of student satisfaction. For two of these measures (SCLASS, SVISIT), LEVEL was the only input to contribute to the variance. Also, REAS explained some of the variance in two measures.

Overall, student inputs, for the most part, did meet the expectations of the model. All student inputs were related to certain variables in the relationships analyzed. The number of measures where variance was accounted for by student inputs varied. Motivation (MOT) accounted for variance in 14 of 24 measures, pre-achievement (PRE-ACH) and level of study (LEVEL-8 measures), volunteer work experience (VOL-6 measures), reason for participating in co-operative education (REAS-5 measures), and

part-time work experience (PART-2 measures). Motivation was the best predictor for all but two measures of educational efficiency and student satisfaction. The effect of PRE-ACH and LEVEL was greatest for post -achievement and student satisfaction. REAS showed similar relationships to educational efficiency and student satisfaction. VOL was a better predictor of educational efficiency than student satisfaction. The effect of PART was only evident with problem solving.

Problem Solving Variables

Problem solving activities were expected to be interrelated and to relate to educational efficiency (see Table 28).

Table 28

Summary of the Significant Relationships Among Measures of Problem Solving and for Problem Solving with Educational Efficiency

	Problem Solving				
	COORD	INTEG	STRESS	ADAPT	RES
Interrelationships					
INTEG	*				
STRESS	*	-			
ADAPT	*	-	-		
RES	*	-	-	-	
Efficiency					
COUN	-	-	-	-	*
SUB	-	-	-	-	-
PREP	*	-	-	-	-
JOB	-	-	-	-	-
CLASS	-	-	-	-	-
VISIT	-	-	-	-	*
EVAL	-	-	-	-	-

Interrelationships among the problem solving activities were not as high as expected; however, significant interrelationships were found for COORD with each of the others. Positive staff perceptions of the coordination of work tasks was consistently related to a greater ability to adapt to the external environment (ADAPT), greater sufficiency and satisfaction with resources (RES), greater feelings of loyalty and commitment (INTEG), and to a lesser extent, to lower amounts of tension among participants (STRESS). Had the sample size been larger than $N=21$, it is likely that more interrelationships would have been significant. From the six possible interrelationships which were not significant, two relationships were close to being significant (ADAPT and RES .36, RES and INTEG .27). Had the problem solving scale INTEG been more reliable, it is also likely more relationships among scales would have occurred.

The effects of problem solving on *educational efficiency* were also not as great as one had hoped. Only three problem solving activities had significant relationships with certain measures of educational efficiency. Allocation of resources (RES) related to two measures (COUN, VISIT). The greater the sufficiency and satisfaction with resources, the higher perceptions of the quality of care received in the counselling process and the visits made to the workplace. Co-ordination of work tasks (COORD) related to one measure (PREP). The greater the ability to coordinate the work tasks, the more positive students felt about preparation for the workplace. Three problem solving activities (INTEG, STRESS, ADAPT) had no significant association with any measure of educational efficiency. Staff perceptions of loyalty and commitment, the amount of tension, and ability to adapt to the external environment did not relate to student perceptions of educational efficiency. The relationship of problem solving to educational efficiency is a very important part of the model. This was not evident in the results. As mentioned earlier, the small sample size limited the number of significant relationships which might have occurred with a larger number of schools. As well, problem solving is at the department level. This was usual given the desire to assess relationships among variables within a subsystem; however, it is likely that individual teachers problem solve in unique ways as they interact with students, teachers, and employers. This effect cannot be assessed accurately without a direct measure of these relationships.

Overall, *problem solving did not meet the expectations of the model.*

Interrelationships were only consistent for one scale, COORD. All other interrelationships were very low. For educational efficiency, only a few significant relationships were found with RES and COORD. Three problem solving activities (INTEG, STRESS, ADAPT) had no effect on any measure of educational efficiency. Taken at face value, these results are not very good; however, there were possible reasons to explain the poor performance of

problem solving. For one thing, Georgopoulos (1972) indicated that problems can occur at the individual member level and collectivity level. Given this, it is likely there were some individual effects, which for reasons of anonymity were not assessed. Second, there were some measurement problems. Consistent with Georgopoulos (1986), the scale INTEG was problematic. This scale had only three items, a very low reliability, and very low relationships with other scales. Perhaps additional items or a complete revision of the scale could strengthen the reliability and validity. Third, it is likely the small sample size (N=21 schools) was problematic. Finally, relationships may have been larger if there had been more schools from different regions, as well as, other provinces.

Structure Variables

It was predicted that structure variables would relate to problem solving, educational efficiency, achievement, and student satisfaction (see Table 29).

Structure variables had very little association overall to *problem solving* activities of co-operative education staff. In total, four structure variables (SIZE, LOC, MAT, STUD) explained variance in only two measures of problem solving, adaptation (ADAPT) and integration (INTEG). The problem solving activities of COORD, STRESS, and RES were not related to any structure variables. The population of the school (SIZE), school location (LOC), and number of students involved in co-operative education (STUD) were related to differences in staff perceptions of relationships with the community, collaboration for services, and satisfaction with contacts (ADAPT). The location of the school (LOC) was related to staff perceptions of integration (INTEG). The number of teachers involved in co-operative education was not related to any problem solving activity. Again there is some sense of the potential for structure to relate to a much greater degree to problem solving activities of co-operative education staff. The small sample size (N=21) was certainly a factor in the poor results for this important part of the model.

The effect of structure on *educational efficiency* was evident, but again in a very limited way. Three structure variables, maturity of co-operative education programs (MAT), number of students involved (STUD), and number of teachers involved (TEACH) were related to certain of the scales of educational efficiency. Differences among groups however, were only found by number of students and teachers for two scales of educational efficiency, visits to the workplace (VISIT) and evaluation activities (EVAL) and by number of teachers for classroom integration activities (CLASS). No clear pattern was found to explain the differences. It was likely that differences were probably a result of individual teacher effects.

Table 29

Summary of Significant Relationships for Structure with Problem Solving, Educational Efficiency, Achievement, and Student Satisfaction

	Structure				
	SIZE	LOC	MAT	STUD	TEACH
Problem Solving					
COORD	-	-	-	-	-
INTEG	-	*	-	-	-
STRESS	-	-	-	-	-
ADAPT	*	-	*	*	-
RES	-	-	-	-	-
Efficiency					
COUN	-	-	-	-	-
SUB	-	-	-	-	-
PREP	-	-	-	-	-
JOB	-	-	-	-	-
CLASS	-	-	-	-	*
VISIT	-	-	-	*	*
EVAL	-	-	*	*	*
Achievement					
Satisfaction					
SCOUN	*	-	-	-	*
SSUB	-	-	-	-	*
SPREP	-	-	-	-	*
SJOB	-	-	-	-	*
SCLASS	-	-	-	-	*
SVISIT	*	*	-	-	*
SEVAL	-	-	-	-	*
SNEED	-	-	-	*	*
SBEN	-	-	-	-	-
STELL	*	-	-	*	*
SQC	*	-	-	-	*

Structure variables did not appear to relate to *achievement* of students at the end of their program. While a large amount of variance in achievement was accounted for by achievement at the time of entry (PRE-ACH), level of study (LEVEL), and the related subject (SUB), it was thought that structure could be related to achievement. No relationship was found between structure and achievement. Schools in this study were from the same province and typically representative of a middle class economy, therefore, it is likely that greater relationships would occur with a more diverse selection of schools and co-operative education programs.

Structure variables affected *student satisfaction*. All structure variables except maturity of co-operative education programs (MAT) related to student perceptions of certain measures of satisfaction. The number of teachers involved in co-operative education (TEACH) related to all measures of student satisfaction, except student perceptions of the benefits received (SBEN). In this study, a pattern emerged for student satisfaction whereby the middle group tended to be less satisfied than students from the other groups. It was felt that a particular combination of teachers, students, administrators, or other variables was probably having an effect. Population of the school (SIZE) related to four measures of student satisfaction. Students from larger schools were more likely to recommend co-operative education to a friend and were more satisfied with the counselling process, visits at the workplace, and the overall quality of care received from the school. Number of students (STUD) related to two measures, SNEED and STELL. Students in the middle group were less likely to feel their needs were met and that they would tell a friend to take co-operative education than students from schools with the largest number of students involved. Not surprisingly, location of the school (LOC) related to student satisfaction with visits to the workplace (SVISIT). Urban students were more satisfied than rural students.

Overall, *structure variables, to a certain extent, did meet the expectations of the model*. In each set of variables, except achievement, some structure variables had an effect. The set of variables which was most related to structure was student satisfaction. In this set, only MAT showed no relationship. To a lesser extent, educational efficiency was related to only three structure variables. In this set, SIZE and LOC did not relate to any measure. Problem solving was also related to structure variables. Only number of teachers (TEACH) did not relate to any problem solving activity. The number of measures which were related to structure varied. The number of teachers involved in co-operative education (TEACH) related to 13 of 24 measures, the number of students involved (STUD) and population of the school (SIZE) related to five measures, and location of school (LOC) and maturity of co-operative education program (MAT) each related to two measures. In

general, it appeared that relationships were greater for co-operative education program structure variables (maturity of programs, number of students and teachers involved) than for school structure variables (size and location). This is interesting because one is able to manipulate program variables more easily than school structure variables.

Educational Efficiency Variables

Student perceptions of educational efficiency outcomes were very useful in trying to explain variance related to satisfaction and achievement. All measures of educational efficiency, at some point, made contributions (see Table 30).

Table 30

Summary of the Significant Affects of Educational Efficiency on Student Satisfaction and Achievement

	Educational Efficiency						
	COUN	SUB	PREP	JOB	CLASS	VISIT	EVAL
Satisfaction							
SCOUN	*	-	-	-	*	-	*
SSUB	-	*	-	-	-	-	*
SPREP	-	*	*	-	-	-	*
SJOB	-	-	*	*	-	-	*
SCLASS	-	*	-	-	*	*	-
SVISIT	-	-	-	-	-	*	*
SEVAL	-	*	-	-	-	-	*
SNEED	-	-	-	*	-	-	-
SBEN	-	-	-	*	-	-	-
STELL	*	-	-	*	-	-	-
SQC	*	-	*	*	-	*	*
Achievement	-	*	-	-	-	-	-

Educational efficiency accounted for far greater amounts of the variance in *student satisfaction* than any factors mentioned previously. The relationships were not particularly surprising since these measures were all assessed by students. However, all measures of educational efficiency were present in the final model explaining the percentage of variance for the corresponding measures of student satisfaction. Student perceptions of the outcomes in the seven main areas of co-operative education did contribute significantly to variance in student satisfaction for similar measures. It was interesting that student perceptions of the job placement (JOB) was the only variable to significantly contribute the only amount of variance for two measures, how much the program met student needs (SNEED) and the extent students benefitted (SBEN). These were the two measures of satisfaction which had the most variance explained. All measures of educational efficiency except SUB and CLASS contributed to variance in student perceptions of the overall quality of care received (SQC). Student perceptions of the evaluation process (EVAL) in combination with other measures of educational efficiency contributed to the greatest number of measures of student satisfaction (seven) while CLASS on the other hand, contributed to the variance in the fewest measures (two).

The effect of educational efficiency on *achievement* was not as great. One measure of educational efficiency, student perceptions of the related subject (SUB) explained a small amount of variance in achievement of students at the end of their program (POST-ACH). The related subject, as the in-school component, is an integral part of the co-operative education program. The mark students receive in this course is part of the credit package for co-operative education. These results were not surprising since achievement at the time of entry into the co-operative education program (PRE-ACH) and level of study (LEVEL) accounted for 45% of the variance in POST-ACH.

Overall, educational efficiency did meet the expectations of the model. All measures of educational efficiency had an effect on certain measures of student satisfaction. Student perceptions of their job placement (JOB) had the greatest association with student satisfaction. Student perceptions of evaluation activities (EVAL) was also important, as it accounted for variance in the most number of measures. Perceptions of the related subject (SUB), and to a lesser extent, counselling (COUN), preparation for work (PREP), and visits to the workplace (VISIT) also showed relationships with certain measures of student satisfaction. Perceptions of classroom integration activities (CLASS) accounted for variance in the least number of measures. Only one measure of educational efficiency, related subject (SUB), had an effect on achievement. However, of all the scales of educational efficiency, it made practical sense that the related subject should contribute to variance in achievement at the end of the co-operative education program.

Interrelationships (Student Satisfaction and Achievement)

Finally, to a limited extent, *interrelationships of student satisfaction and achievement at the end of the co-operative education program did meet the expectations of the model*. Nine of eleven measures of student satisfaction showed a significant relationship with student achievement at the end of the co-operative education program (POST-ACH). For the most part; these relationships were not very large. However, if PRE-ACH and LEVEL were highly related to achievement (POST-ACH), there was not much variance remaining for other variables to account for. Consistent with these results, measures of student satisfaction were in general, poor predictors of post-achievement (POST-ACH). However, the best student satisfaction predictor of post-achievement was the overall quality of care students received from the school (SQC).

Summary

It would appear that the model does hold promise for understanding the factors which are related in co-operative education as a subsystem (see Figure 5). All of the student inputs had some effect depending on the particular relationships assessed. The weakest relationships were found overall for problem solving and yet, even with the small sample size, all inputs, except motivation, were related to certain of the problem solving activities. It is likely that student inputs would have stronger relationships with problem solving if the sample of schools was much larger. Consistent with the above, problem solving variables did not show many significant relationships. This was particularly disappointing in regard to relationships with educational efficiency. However, it would probably be unwise to discard problem solving as an important factor for the simple reason that there were some valid reasons why problem solving did not perform very well. With some changes in the research design, problem solving still has the potential to impact in a greater way. The measures for the scale integration should be revised to improve their reliability, a larger sample of schools and the addition of direct measures between students and individual teachers would probably increase the number of significant relationships.

The impact of structure variables was less evident in this study; however, at one time or another, all structure variables did relate to certain variables. Structure variables had a greater association overall with student satisfaction than with problem solving and educational efficiency. Certainly the number of teachers involved in co-operative education

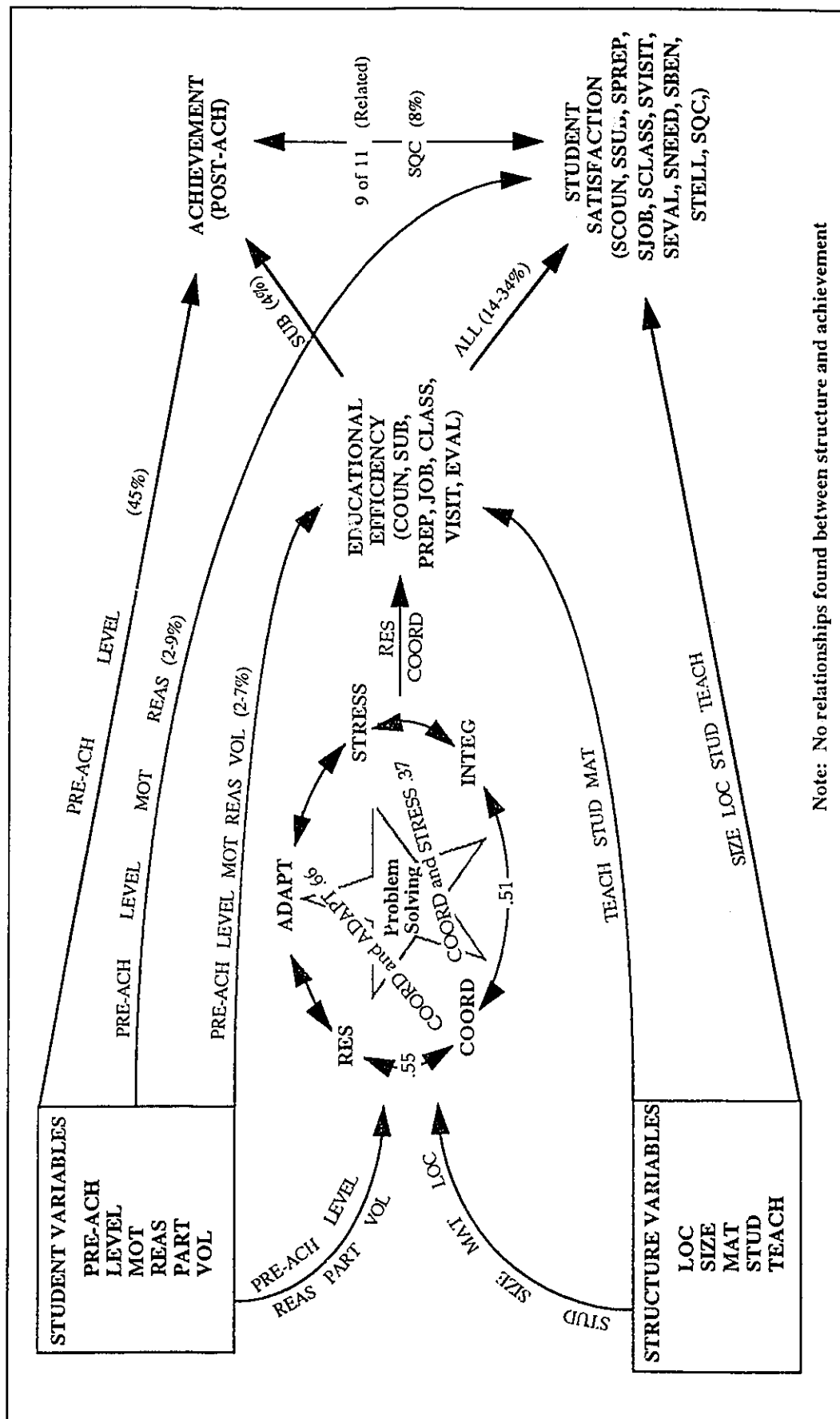


Figure 5. Results of relationships tested in model of organizational effectiveness adapted for co-operative education

was the biggest factor, but number of students involved and size of the school also contributed. Maturity of co-operative education programs and location of school did not make much difference. For maturity, it could be that other factors related to teachers, such as years of experience in co-operative education and amount of training in co-operative education compensate when programs are not as mature. These variables are in the model as staff qualifications (see Figure 2).

Educational efficiency as an outcome in this study, played a major role in understanding student satisfaction. This confirmed the importance of the school's role since what happens to students in school during the time they are involved in co-operative education does relate to their feelings of satisfaction and to a much lesser extent, their achievement.

The final chapter presented includes the limitations and contributions of the study as well as recommendations for future research.

CHAPTER VI

CONCLUSIONS

The Model of Organizational Effectiveness Adapted for Co-operative Education provided a comprehensive framework for the assessment of a number of relationships among variables considered important in the subsystem of co-operative education. In this final chapter, the limitations of the model, the contribution of the study, and recommendations for future research are presented.

Limitations of the Study

The Model of Organizational Effectiveness Adapted for Co-operative Education appears to be relevant despite a number of limitations raised throughout this study. For valid reasons, this study *did not include all the variables in the model*. In particular, certain structural and environmental variables as well as outcomes related to economic and social efficiency were not measured. The *small sample size* was problematic when testing relationships among variables at the school level. A larger sample was intended originally, but because of the teacher strike in 1992 and an internal evaluation of co-operative education, two school boards were unable to participate in the study. *Problems with instrumentation* also restricted the research. Poor reliability for one problem solving scale and to a lesser extent for three scales of educational efficiency likely affected the size of relationships. A more serious limitation was the issue of *anonymity* which had implications for the research design and data analysis. It was impossible to match individual teachers and students to assess direct relationships. The general *survey nature* of the research also presented problems. Self reporting by students is not highly reliable. It is for this reason that different perspectives would increase the strength of the research. Teachers, administrators, and employers would offer different, but valuable, perspectives. The *reliance on quantitative data* in this study also limited the kind of information which could be collected from participants. In addition to questionnaires, Georgopoulos et al (1980) interviewed participants to substantiate information.

All things considered, the results of the study did make a contribution to our knowledge of co-operative education.

Contributions of the Study

The model developed for this study provides a picture of co-operative education as a subsystem and identifies many variables which are considered important in co-operative education. All variables tested in this study were useful, to some extent, in trying to explain certain relationships among student inputs, structure, problem solving, educational efficiency, achievement, and student satisfaction. One now has a substantial amount of information about co-operative education, as a subsystem. This information is valuable for co-operative education practitioners who are interested in the quality of care/service students receive from the school while they are in co-operative education. Furthermore, it seems quite clear that many research opportunities have resulted from this study. The Model of Organizational Effectiveness Adapted for Co-operative Education provides an interesting framework for future research in co-operative education. As a result of this research certain relationships can now be explored more intensely and several relationships which were not tested can now be considered.

Recommendations for Future Research

The Model of Organizational Effectiveness Adapted for Co-operative Education (see Figure 2) has promise for future research in secondary school co-operative education. For the most part, it is important that the model be kept intact so that other variables, which were not included in this study, may be tested. As well, some additional variables related to student inputs might be interesting to consider.

As a result of this study, some revisions are necessary, but overall, it would be inappropriate to delete any variables at this point. *Problem solving*, despite the overall disappointing results, needs to be given a fair chance because of its importance in the model. Some of the problems which may have contributed to poor relationships among certain variables are likely solvable. Similar to Georgopoulos (1986) one scale of problem solving, integration (INTEG), was the most problematic. Teachers in general reported high feelings of loyalty and commitment to their schools and co-op programs; however, reliability was low (.29) and variance among schools was also low. However, it was important to determine if INTEG was reliable and valid in a different setting. It would seem now that the scale for integration should be revised. Perhaps the number of items (3) in the scale could be increased or a completely new scale developed. In addition, given the small sample size (N=21 schools) it is also likely that the relationships among problem solving might be greater with a larger number of schools involved. On the other hand, it

may be that INTEG is not really a problem solving activity and should be deleted from this particular set of variables. Since Georgopoulos (1986) felt staff loyalty, commitment, and feelings of appreciation was essential for problem solving adequacy, it may be more interesting to include INTEG within a different set of variables, whereby feelings of integration become predictors of problem solving adequacy or outcomes related to social efficiency.

Student inputs did contribute in various ways to certain relationships; however, some changes to these measures might strengthen the associations. Achievement of students at the time of entry (PRE-ACH) was a self reported measure. More accurate information obtained from student files would increase the validity of this measure. At the same time, the level of study (LEVEL) in the majority of courses could also be verified. While it is unlikely that students reported an incorrect level of study, any doubt as to accuracy would be eliminated. While not included as an input in this study or even in the complete model, two additional inputs could be considered for future research. It may be very interesting to consider *gender* as one of the student inputs. According to previous research in secondary schools, more females participate in co-operative education than males. However, it is unknown if the quality of care that students receive from the school is different based on gender. Therefore, the issue of gender should probably be considered. Gaskell (1992) has some very interesting insights to offer on gender within a social context which could be very beneficial for co-operative education teachers and researchers. Also, the extent of involvement in co-operative education for students with *special needs* is relatively unknown at this time. There is a sense, however, that their involvement is quite limited. It might be very interesting to look at student inputs which would reflect the special needs of students, particularly students who for physical or cultural reasons may be disadvantaged in the labour market. A more diverse sample of schools involved in co-operative education from large urban cities with immigrant populations might be appropriate to access this information.

It is worthwhile to retain *structure variables* in the model, particularly, if the sample size is increased to allow for more diversity. However, some small revisions should be considered. In the present study, certain schools classified as urban were probably more suburban in location (LOC) and some classified as rural were probably more suburban. With a larger sample, an additional category for LOC might include "suburban" to make the distinction for location more clear. For the population of the school (SIZE) it was felt that most of the schools involved were fairly large. Again, a bigger sample would likely include a more distinct range of school populations. The same would

likely hold for the number of students and teachers involved in co-operative education (STUD).

Reliabilities for certain scales of educational efficiency including preparation for work (PREP, .55), related subject (SUB, .55), and counselling (COUN, .52) were not as high as one would like. This may have affected the magnitude of relationships with student inputs, structure and problem solving. These scales should be reviewed in order to determine whether revisions are necessary.

Achievement at the end of the co-operative education program appears to be a worthwhile outcome to keep in this model. However, since it was a self reported measure, more accurate information obtained from student files might be more appropriate.

The measures for student satisfaction were also interesting outcomes in this study. However, the number of measures was quite cumbersome. It might be possible to reduce the number of measures to include satisfaction overall with the in-school areas of co-operative education (SCOUN, SSUB, SPREP, SCLASS, SEVAL) and satisfaction overall with the out-of-school areas of co-operative education (SJOB, SVISIT). Measures related to needs (SNEED), benefits (SBEN), recommendation to a friend (STELL), and overall quality of care (SQC) appear satisfactory.

Throughout the presentation of results and discussion of the model fit it was pointed out that other factors were seemingly having an effect. Some of these factors were included in the Model of Organizational Effectiveness Adapted for Co-operative Education but in a vague way. It was quite clear that student inputs and structure variables did not relate to problem solving as highly as one had thought. While there were some valid reasons for this, it is important to consider *teacher inputs*. In the original model, staff qualifications were generally related to problem solving. For research purposes, teacher inputs which include primary role, training, and years of experience in co-operative education, as well as gender, would be interesting to assess.

Other factors are also important. In this study, only student perceptions of organizational effectiveness (mainly educational efficiency) were assessed. However, consistent with Georgopoulos, the model also has relevance for different perspectives. It was possible, that individual teachers, administrators, and employers with their unique personalities and styles may have affected the results in certain schools. Therefore, in order to ascertain these effects, it would be important to include other perspectives as was intended in the original model.

Finally, the importance of the work placement was very evident in this study. More information on the factors in the workplace which contribute to organizational effectiveness would be a challenging project for researchers involved in qualitative methodology.

References

- Argote, L. (1982). Input uncertainty and organizational coordination in hospital emergency units. Administrative Science Quarterly, 27(3), 420-434.
- Branton, G. R., VanGyn, G., Cutt, J., Loken, M., Ney, T., & Ricks, F. (1990). A model for assessing learning benefits in cooperative education. The Journal of Cooperative Education, 26(3), 30-40.
- Cameron, K. S. (1978). Measuring organizational effectiveness in institutions of higher education. Administrative Science Quarterly, 23(4), 604-634.
- Cameron, K. S. (1981). Domains of organizational effectiveness in colleges and universities. Academy of Management Journal, 24(1), 25-47.
- Cameron, K. S. (1985). Critical questions in assessing organizational effectiveness. In J. L. Gibson, J. M. Ivancevich, & J. H. Donnelly (Eds.). Organizations close-up: A book of readings (pp. 46-53). Plano, TX: Business Publications.
- Cameron, K., & Whetten, D. (1983). Organizational effectiveness: A comparison of multiple models. New York: Academic Press.
- Campbell, J. P. (1976). Contributions research can make in understanding organizational effectiveness. Organization and Administrative Sciences, 7(1-2), 29-45.
- Chelladurai, P. (1987). Multidimensionality and multiple perspectives of organizational effectiveness. Journal of Sport Management, 1(1), 37-47.
- Cheng, J. (1977). Organizational coordination, interdependence and their relevance to research unit effectiveness: A comparative study. Unpublished doctoral dissertation. University of Michigan.
- Cheng, E. (1990). Characteristics of co-operative education students. In E. Nichols (Ed.), Cooperative education: Coming of age (pp. 19-50). Toronto, ON: Ontario Educational Research Council.

- Child, J. (1974). Managerial and organizational factors associated with company performance-Part 1. The Journal of Management Studies, 2(3), 175-189.
- Clegg, S., & Dunkerley, D. (1980). Organization, class and control. London, England: Routledge & Kegan Paul.
- Connolly, T., Conlon, E. J., & Deutsch, S. J. (1980). Organizational effectiveness: A multi-constituency approach. Academy of Management Review, 5(2), 211-217.
- Cooke, R. & Rousseau, D. (1981). Problems of complex systems: A model of system problem solving applied to schools. Educational Administration Quarterly, 17(3), 15-41.
- Cummings, T. G. (1980). Systems theory for organizational development. New York: John Wiley & Sons.
- Cunningham, J. B. (1977). Approaches to the evaluation of organizational effectiveness. Academy of Management Review, 2(3), 463-474.
- Dhanota, A. S., Wright, E.N., & Toplak, M. (1980). Co-operative education, career exploration visit and work experience weeks: An evaluation. Toronto, ON: Toronto Board of Education Research Service.
- Donaldson, E. L. (1989). Links between education and employment: A case study of the transition from school to work. Unpublished doctoral dissertation, University of Toronto, Toronto.
- Donaldson, E. L. (1992). Adjusting to the effects of students working part-time. The Canadian School Executive, 12(3), 3-7.
- Etzioni, A. (1964). Modern organizations. Englewood Cliffs, NJ: Prentice-Hall.
- Evan, W. M. (1976). Organization theory and organizational effectiveness: An exploratory analysis. Organization and Administrative Science, 7(1-2), 15-28.
- Fletcher, J. K. (1990). Self-esteem and cooperative education: A theoretical framework. The Journal of Cooperative Education, 26(3), 41-55.

- Friedlander, F., & Pickle, H. (1968). Components of effectiveness in small organizations. Administrative Science Quarterly, 13(2), 298-304.
- Gaskell, J. (1992). Gender matters from school to work. Toronto, ON: Open University Press, Buckingham, and OISE Press.
- Georgopoulos, B. S. (1965). Normative structure variables and organizational behavior: A comparative study. Human Relations, 18(2), 155-169.
- Georgopoulos, B. S. (1972). The hospital as an organization and problem-solving system. In B.S. Georgopoulos (Ed.), Organization research on health institutions (pp. 9-48). Ann Arbor, MI: Institute for Social Research, University of Michigan.
- Georgopoulos, B. S. (1975). Hospital organization research: Review and source book. Philadelphia: Saunders.
- Georgopoulos, B. S. (1978). An open-system approach to evaluating the effectiveness of hospital emergency departments. Emergency Medical Services, 7(6), 118-119.
- Georgopoulos, B. S. (1986). Organizational structure, problem-solving and effectiveness: A comparative study of hospital emergency services. San Francisco, CA: Jossey-Bass, Inc..
- Georgopoulos, B. S., & Cooke, R. A., & Associates (1980). A comparative study of the organization and performance of hospital emergency services: Selected descriptive findings and the research instruments. Ann Arbor, MI: Institute for Social Research, University of Michigan.
- Georgopoulos, B. S., & Mann, F. C. (1962). The community general hospital. New York: MacMillan.
- Georgopoulos, B. S., & Matejko, A. (1967). The American general hospital as a complex social system. Health Services Research, 2 (1), 76-112.
- Georgopoulos, B. S., & Tannenbaum, A. S. (1957). A study of organizational effectiveness. American Sociological Review, 22(5), 534-540.

Georgopoulos, B. S., & Wieland, G. F. (1964). Nation wide study of coordination and patient care in voluntary hospitals. Ann Arbor, MI: Institute for Social Research, University of Michigan.

Germerscheid, R. D. (1980). A summary report of work experience education program effectiveness and organization. Alberta: Alberta Education.

Goodman, P. S., Atkin, R. S., & Schoorman, F. D. (1983). On the demise of organizational effectiveness studies. In K. S. Cameron, & D. A. Whetten (Eds.), Organizational effectiveness: A comparison of multiple models (pp. 163-183). New York: Academic Press.

Goodman, P. S., Pennings, J. M., & Associates (1977). New perspectives on organizational effectiveness. San Francisco, CA: Jossey-Bass, Inc..

Guskin, A. E. (1993). On changing fundamental conceptions of undergraduate experience: Experiential learning and theories of intelligence. The Journal of Cooperative Education, 28(2), 22-28.

Hall, R. H. (1972). Organizations: Structure and process. Englewood Cliffs, NJ: Prentice Hall.

Heinemann, H. N. (1983). Towards a pedagogy for cooperative education. The Journal of Cooperative Education, 19(2), 14-26.

Heinemann, H. N., DeFalco, A. A., & Smelkinson, M. (1992). Work-experience enriched learning. The Journal of Cooperative Education, 28(1), 17-33.

Hoy, W. K., & Miskel, C. G. (1991). Educational administration: Theory, research and practice (4th ed.). New York: Random House.

Hughes, J., & King, A. (1982). A study of cooperative education in Ontario secondary schools. Toronto, ON: Provincial Research Committee, OSSTF.

Jobson, J. D., & Schneck, R. (1982). Constituent view of organizational effectiveness: Evidence from policy organization. Academy of Management Journal, 14(1), 25-46.

Katz, D., & Kahn, R. (1966). The social psychology of organizations. New York: Wiley & Sons, Inc..

Katz, D., & Kahn, R. (1978). The social psychology of organizations (2nd ed.). New York: Wiley.

Keeley, M. (1984). Impartiality and participant-interest theories of organizational effectiveness. Administrative Science Quarterly, 29(1), 1-25.

Kirchhoff, B. A. (1977). Organization effectiveness measurement and policy research. The Academy of Management Review, 2(3), 347-355.

Krathwohl, D. (1973). The taxonomy of educational objectives: Use of the cognitive and affective domains. In B. R. Worthen & J. R. Sanders (Eds.), Education evaluation theory and practice (p. 248). Belmont, CA: Wadsworth.

Lally, M. J. (1990). Retention factors and co-operative education. In E. Nichols (Ed.), Cooperative Education: Coming of Age (pp. 73-84). Toronto, ON: Ontario Educational Research Council.

Leary, M. R., & Altmaier, E. M. (1980). Type I error in counseling research: A plea for multivariate analyses. Journal of Counseling Psychology, 27(6), 611-615.

Likert, R. (1967). The human organization. New York: McGraw-Hill.

Longest, B. B. (1974). Relationships between coordination, efficiency, and quality of care in general hospitals. Hospital Administration, 19(4), 65-86.

Mahoney, R. A., & Wetzal, W. (1969). Managerial models of organizational effectiveness. Administrative Science Quarterly, 14(3), 357-365.

Miles, R. H. (1980). Macro organizational behaviour. Santa Monica, CA: Goodyear.

Ministry of Education (1989). Co-operative education: Policies and procedures for Ontario secondary schools. Toronto: ON.

Ministry of Education (1988). Cooperative education draft policy document. Toronto, ON: Ministry of Education.

Mintzberg, H. (1979). The structuring of organizations. Englewood Cliffs, NJ: Prentice-Hall.

Mott, P. E. (1972). The characteristics of effective organizations. New York: Harper & Row.

Ottawa-Carleton Secondary Schools (1987). Cooperative education. (Available from [The Ottawa Board of Education, 330 Gilmour Street, Ottawa, Ontario])

Owens, T. R., & Owen, S. K. (1981-1982). Improving learning in the workplace. The Journal of Cooperative Education, 18(2), 57-65.

Parsons, T. (1960). Some ingredients of a general theory of formal organization. In A. W. Halpin (Ed.), Administrative theory in education (pp. 40-72). New York: MacMillan.

Perrow, C. (1970). Organizational analysis: A sociological view. Belmont, CA: Wadsworth Publishing Company, Ltd..

Pfeffer, J., & Salancik G.R. (1978). The external control of organizations. New York: Harper & Row.

Price, J. L. (1968). Organizational effectiveness: An inventory of propositions. Homewood: Irwin.

Price, J. L. (1972). The study of organizational effectiveness. Sociological Quarterly, 13,(1), 3-15.

Rowan, B., Raudenbush, S. W., & Cheong, Y. F. (1993). Teaching as a nonroutine task: Implications for the management of schools. Educational Administration Quarterly, 29(4), 479-500.

Scott, W. R. (1977). Effectiveness of organizational effectiveness studies. In P.S. Goodman, J. M. Pennings, & Associates (Eds.), New perspectives on organizational effectiveness (pp. 63-95). San Francisco, CA: Jossey-Bass.

Shaughnessy, P. (1986). Personal skills development of co-operative education students in two secondary schools in the city of York. Guidance and Counselling, 1(4), 45-52.

Smitas, S. (1984). Employer and employee perspectives of secondary school business courses offered through cooperative education. Unpublished master's thesis, Ontario Institute for Studies in Education, Toronto, ON.

Steers, R. M. (1975). Problems in measuring organizational effectiveness. Administrative Science Quarterly, 20(4), 546-558.

Stewart, J. H. (1976). Factors accounting for goal effectiveness: A longitudinal study. Organization and Administrative Sciences, 7(1-2), 109-121.

Stresman, H. E. (1986). A study of personal skills of co-operative education students. Unpublished master's thesis, Lakehead University, Lakehead, ON.

Sutton, R.I., & Ford, L.H. (1982). Problem-solving adequacy in hospital subunits. Human Relations, 35(8), 675-701.

Taylor, M. C., Boss, M. W., Bedard, R., Thibault, C. J., & Evans, K. (1990). Variables related to the transition of youth from school to work. Canadian Journal of Counselling, 24(3), 153-164.

Thibault, C. J. (Ed.). (1991, June). Student perceptions of co-operative education programs in B.C. secondary schools. (Available from [Carol Thibault, 1832 Florida Avenue, Ottawa, Ontario, K1H 6Z1])

Thibault, C. J. (Ed.). (1993, June). Organizational effectiveness of co-operative education. (Available from [Carol Thibault, 1832 Florida Avenue, Ottawa, Ontario, K1H 6Z1])

Thompson, J. D. (1967). Organizations in action. New York: McGraw Hill.

- Thompson, R. W., & Orton, K. D. (1985). Evaluation of programs for handicapped children: A strategic constituent approach. Evaluation Review, 9(6), 701-715.
- Tsui, A. S. (1990). A multiple-constituency model of effectiveness: An empirical examination at the human resource subunit level. Administrative Science Quarterly, 35(3), 458-483.
- Van de Ven, A. H. (1980). A process for organization assessment. In E. E. Lawler, D. A. Nadler, & C. Cammann (Eds.), Organizational assessment (pp. 548-568). New York: John-Wiley & Sons.
- Wellington County Board of Education. (1984). Cooperative education: Co-op program implementation evaluation profile. Available from The Wellington County Board of Education, 155 Paisley St., Guelph, Ontario N1H 2P3.
- Wilson, J. W. (1985). Analysis of cooperative education as a work/education joint venture. Transition Learning, 1(1), 194-206.
- Wilson, J. W. (1988). Research in cooperative education. The Journal of Cooperative Education, 24(1-2), 77-89.
- Winer, E., & Kane, S. (1983). Employer evaluation of high school work experience programs. The Journal of Cooperative Education, 20(1), 35-44.
- Wodlinger, K. J. (1990). Integrating an academic area with cooperative education at the junior secondary level: A case study. Unpublished master's thesis, University of Victoria, Victoria, BC.
- Yuchtman, E., & Seashore, S. E. (1967). A system-resource approach to organizational effectiveness. American Sociological Review, 32(5), 891-903.
- Zammuto, R. F. (1982). Assessing organizational effectiveness: Systems change, adaptation, and strategy. Albany, NY: State University of New York Press.
- Zammuto, R. F. (1984). A comparison of multiple constituency models of organizational effectiveness. Academy of Management Review, 9(4), 606-616.

APPENDIX A
STUDENT QUESTIONNAIRE

1. Circle: Female or Male

2. Circle the grade you are now in at school. Grade 11 or Grade 12

3. Circle the number of co-op credits you have earned in high school (including any credit which is not yet finished) 1 2 3 4 5

4. Check (✓) your overall average grade in school at the time you applied for the co-op program. (Check ONE only)

☐ A (80-100%) ☐ B (70-79%) ☐ C (60-69%)

☐ D (50-59%) ☐ E (Below 50%)

5. What is your overall average grade now? _____%

6. What level of study are most of your courses? (Check ONE only)

☐ Basic ☐ General ☐ Advanced

7. How much did you want to take the co-op program? (Check ONE only)

_____ Very much
_____ Somewhat
_____ Not very much

8. What was the most important reason why you wanted to take co-op. Please add any reason not found below. (Check ONE only)

_____ To check out a specific career interest

_____ To give me a break from school

_____ To get some work experience for a future job

_____ To help make decisions about my college or university education

_____ To keep me from dropping out of school before graduation

_____ To get started in an apprenticeship program

_____ Other _____
(please describe)

9. Before taking co-op, check (✓) how often you were doing part-time and volunteer work.

	Regularly	Occasionally	Never
Worked part-time			
Did volunteer work			

10. Thinking back to when you began the co-op program, check (✓) how much you agree or disagree with each of the following comments.

	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
I <u>had</u> an open and friendly relationship with the person who gave me information about co-op.					
I <u>was not satisfied</u> with my co-op timetable.					
The drawbacks of the co-op program were <u>fully discussed</u> .					
I <u>had a chance</u> to talk about what I wanted to get out of the co-op program.					
I <u>did not know</u> what the school expected of me as a co-op student.					

11. Check (✓) which of the following subject areas best stands for your in-school or related co-op course. (Check ONE only)

- | | |
|---|---|
| ☐ Science | ☐ Computer Studies |
| ☐ Physical Education | ☐ Technical/Trades |
| ☐ Family Management | ☐ Language |
| ☐ Business | ☐ Creative Arts |
| ☐ Other _____ | |
- (please name)

12. Circle the grade level of this related course. Gr.10 Gr.11 Gr.12

13. Circle the level of study of the related course. Basic General Advanced

14. What is your average grade now in the related course? _____%

15. Check (✓) how much you agree or disagree with the following comments about your related course.

	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
The things I learn in the related course are <u>not at all like</u> my co-op job experiences.					
Homework in the related course <u>usually</u> has something to do with my co-op job.					
Talking about my co-op job <u>is not encouraged</u> by the related course teacher.					
My marks in the related course are <u>decreasing</u> because of my co-op job.					
The related course <u>means more</u> to me because of my co-op job experiences.					

16. Circle on the scale from 1 to 5 how well each of the following areas were covered in preparing you for the work place.

	Not covered at all					Very well covered				
Preparation of a resume	1	2	3	4	5					
Letter of application	1	2	3	4	5					
Listening and talking skills	1	2	3	4	5					
Job interview skills	1	2	3	4	5					
Getting along on the job	1	2	3	4	5					
Health and safety rules for the workplace	1	2	3	4	5					
Union practices in the workplace	1	2	3	4	5					
What the employer expects	1	2	3	4	5					
Finding out about different careers	1	2	3	4	5					
Finding out about my strengths and weaknesses	1	2	3	4	5					

17. Please check (✓) how much you agree or disagree with each of the following comments about your preparation for the work place.

Strongly Disagree Disagree Not sure Agree Strongly Agree

I <u>was not satisfied</u> with the information I received about the workplace.					
The activities to prepare me for work <u>were very useful</u> .					
I <u>did not feel confident</u> about going out to work.					
I <u>understood much better</u> the kind of co-op job that would suit me.					
I felt more time <u>was needed</u> to prepare me for the work place.					

18. Did you have any employer interviews? ___Yes ___No

* If YES, did you compete with other students for the same job?

___Yes ___No

19. Was a training plan, with the things you might learn on the job, given to you?

___Yes ___No

* If YES, did you help prepare the training plan?

___Yes ___No

20. As a co-op student, what is the name of your co-op job? (example: teacher aide, mechanic's helper, lab assistant).

The name of my co-op job is: _____

21. Please check (✓) how much you agree or disagree with each of the following comments about your co-op job.

	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
The co-op job <u>is not</u> in my area of interest.					
I <u>am disappointed</u> with the things I learn on the co-op job.					
The things I do on the job <u>challenge</u> me.					
The people I work with <u>like</u> what I do.					
I <u>do not like</u> to spend more hours at work than I have to.					
Time spent at work <u>is not as valuable</u> as the time spent in school.					

22. Please check (✓) how much you agree or disagree with each of the following comments about visits from the school while you are working.

	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree	No visits Made
The visits <u>keep me in touch</u> with the school.						
The visitor <u>does not understand</u> my work.						
I <u>can talk</u> openly with the visitor.						
The visitor <u>does not let me know</u> how I am doing at work.						
The visits from the school <u>help make sure</u> I am doing useful work.						
The visits from the school <u>do not seem important</u> to my work supervisor.						
I <u>feel very special</u> when someone from the school comes to visit me.						
I would <u>not want</u> more visits from the school.						

23. When you return to your co-op class, circle on the scale from 1 to 5 how much each of the following activities happen.

	Not at all				A great deal
Talk about co-op experiences	1	2	3	4	5
Talk about problems at work	1	2	3	4	5
Talk about how co-op may help future plans	1	2	3	4	5
Talk about topics that students choose	1	2	3	4	5
Talk about how school and work fit together	1	2	3	4	5
Write down feelings about co-op experiences	1	2	3	4	5
Record the daily work tasks	1	2	3	4	5
Complete co-op assignments	1	2	3	4	5

24. Please check (✓) how much you agree or disagree with each of the following comments about your co-op class.

	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
The feeling in the class is <u>warm and friendly</u> .					
I am able to make <u>connections</u> between my job experiences and my school studies.					
The things done in the class are <u>not very useful</u> to me.					
The topics we talk about in class are very <u>interesting</u> .					
I <u>do not look forward</u> to meeting with other co-op students.					
My work time <u>means more to me</u> after meeting with co-op students.					

25. Circle on the scale from 1 to 5 how much each of the following activities are used to give you a mark for your co-op experience.

	Not at all				A great deal
Written reports from the employer	1	2	3	4	5
Student diary or log of daily activities	1	2	3	4	5
Student journal with feelings about co-op job	1	2	3	4	5
Assignments about the co-op job	1	2	3	4	5
Participation in the co-op class	1	2	3	4	5
Self evaluation	1	2	3	4	5

26. Please check (✓) how much you agree or disagree with each of the following comments about the evaluation of your co-op experience.

	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
I often <u>receive feedback</u> from the school on my progress at work.					
The feedback I receive from the school is <u>not very helpful</u> to me.					
The <u>school encourages my employer</u> to discuss the written reports with me.					
The school <u>seldom talks about</u> the employer's reports with me.					
The activities used by the school to evaluate my co-op experience <u>are fair</u> .					
The school's evaluation is <u>just as important</u> as the employer's evaluation.					
I feel <u>very satisfied</u> with how I am evaluated by the school.					

27. For each of the areas listed, circle on the scale from 1 to 5, how you feel about the quality of the service you received overall, from the school in the co-op program.

	Poor			Excellent	
	1	2	3	4	5
Counselling for participation in co-op	1	2	3	4	5
Selection of related co-op course	1	2	3	4	5
Preparation for the work place	1	2	3	4	5
Suitability of work placement	1	2	3	4	5
Visitation at the work place	1	2	3	4	5
Activities to link school and work	1	2	3	4	5
Grading of co-op experiences	1	2	3	4	5

28. Thinking back to the most important reason why you wanted to take co-op, circle on the scale from 1 to 5 how much the co-op program met this need.

Did not meet this need			Completely met this need	
1	2	3	4	5

29. How much did you benefit overall from the co-op program? (Check ONE only)

- ☐ More than I had hoped for
☐ Exactly what I had hoped for
☐ Not as much as I had hoped for
☐ I did not benefit at all

30. Would you tell a friend to take co-op?

- ☐ Yes ☐ Maybe ☐ No

31. If you could improve the co-op program, check (✓) as many of the areas listed where you would you like to see changes.

___ No changes necessary

- | | |
|---------------------------------|----------------------------|
| ___ Timetable choices | ___ Responsibility at work |
| ___ School workload | ___ Hours of work |
| ___ Teacher attitudes | ___ Workers attitudes |
| ___ Transportation to co-op job | ___ Choice of job |
| ___ Other _____ | |

(please describe)

32. What do you plan to do after graduation? (Check ONE only)

- ___ Continue my education
 ___ Find full time work
 ___ Work and go to school part time
 ___ I am not sure
 ___ Other _____

(please describe)

33. On a scale from 1 to 10, how would you rate the overall quality of care you received from the school, in the co-op program?

Poor

Excellent

1 2 3 4 5 6 7 8 9 10

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

Carol Thibault
 University of Ottawa

APPENDIX B
TEACHER QUESTIONNAIRE

CO-OP TEACHER QUESTIONNAIRE

The following questionnaire is about work relations, and in particular, how people who work together solve problems. This questionnaire is for all teachers who are involved in any way with the administration, implementation, and delivery of the co-operative education program. For the purpose of this study only, these teachers will be considered to make up the "Cooperative Education Department". Your assistance in answering the following questions is greatly appreciated.

PART I: BACKGROUND INFORMATION

1. Check: ___ Female or ___ Male
2. Check the position which best describes your primary role in the co-op program at this time.

 ___ Related-subject classroom teacher
 Discipline: _____
 ___ Program coordinator or Contact person
 ___ Guidance counsellor for co-op students
 ___ Other: _____
 (please specify)
3. Indicate from the options provided how much of your workload is designated for co-operative education. (Check ONE only)

 ___ Full-time workload for co-op
 ___ Three-quarter workload
 ___ Half-time workload
 ___ Less than half-time workload
 ___ Other: _____
 (please specify)
4. Which additional qualifications have you received in co-op education?

 ☐ Part I: Co-op ☐ Part II: Co-op ☐ Co-op Specialist

 ☐ None of the above
5. How many years have you been involved in co-op education? ___ Years

PART II: PROBLEM SOLVING

A. COORDINATION

1. In general, how well planned are the teaching/work assignments of the different people who work together in the co-op department? (Check ONE only)

☐ Extremely well planned
☐ Very well planned
☐ Fairly well planned
☐ Not so well planned
☐ Not planned well at all

2. To what extent are the various interrelated program tasks and course activities well timed in the everyday work of this co-op department? (Check ONE only)

☐ To a very great extent
☐ A great extent
☐ A fair extent
☐ A small extent
☐ Not at all

3. Overall, how well do the different jobs and activities around the co-op student fit together in the co-op department? (Check ONE only)

☐ They fit together extremely well
☐ Very well
☐ Fairly well
☐ Not so well
☐ Not well at all

4. How frequently do the people in this department do their jobs in a way that their joint efforts and activities will fit together smoothly? (Check ONE only)

☐ Always or nearly always
☐ Very frequently
☐ Fairly frequently
☐ Infrequently
☐ Not at all

5. Generally, to what extent do the co-op teachers make adjustments in their work activities in order to facilitate the smooth operation of the co-op program? Would you say that they make adjustments: (Check ONE only)

☐ To a very great extent
☐ A great extent
☐ A fair extent
☐ A small extent
☐ Not at all

6. Here in the co-op department, to what extent do the different people who work together take into account each other's work problems and needs as they go about doing their own activities? (Check ONE only)

☐ To a very great extent
☐ A great extent
☐ A fair extent
☐ A small extent
☐ Not at all

7. On the whole, how successful are the people in this department in coming up with better ways of fitting together their related work efforts and activities? (Check ONE only)

☐ Extremely successful
☐ Very successful
☐ Moderately successful
☐ Not so successful
☐ Not at all

B. INTEGRATION

8. On the whole, to what extent does the School Administration understand and appreciate the work problems and needs of the co-op teachers? (Check ONE only)

☐ To a very great extent
☐ A great extent
☐ A moderate extent
☐ A small extent
☐ Not at all

9. Personally, how strongly identified with or how strongly committed do you feel you are to each of the following? (Check ONE for each)

Extremely Strongly Very Strongly Moderately Strongly Slightly Strongly Not at all

The School

The Co-op Program

C. STRAIN

10. To what extent do the people in the co-op department make an effort to avoid creating problems or interferences with each other's duties and responsibilities? (Check ONE only)

☐ To a very great extent
☐ A great extent
☐ A moderate extent
☐ A small extent
☐ Not at all

11. To the best of your knowledge, how frequently are there unnecessary work delays (avoidable delays) among the people whose work is related to co-op?

☐ Extremely frequently
☐ Very frequently
☐ Fairly frequently
☐ Not too frequently
☐ Not at all

12. All things considered, how much tension (friction, strain, or conflict) would you say is there between the groups specified in each of the following pairs? (Check ONE for each pair of groups)

Level of Tension

	A high level	A moderate level	A low level	A very low level	No tension at all
Co-op teachers and administration					
Co-op teachers and non co-op teachers					
Co-op teachers and co-op students					
Some co-op teachers and other co-op teachers					
Co-op teachers and employers					
Co-op teachers and support personnel					

D. ADAPTATION

13. At the present time, what kind of reputation does this co-op department have in the community outside of the school?

- ___ An excellent reputation in the community
- ___ A very good reputation
- ___ A good reputation
- ___ A fair reputation
- ___ A rather poor reputation in the community

14. Do the employers in the community seem to have adequate information about the services which this co-op department can and cannot provide? (Check ONE only)

Most employers seem to have:

- ☐ Complete adequate information
- ☐ Very adequate information
- ☐ Fairly adequate information
- ☐ Not so adequate information
- ☐ Inadequate information

15. The educational needs of communities change from time to time. How well has the co-op department been able to keep up and respond to such changes? (Check ONE only)

- ☐ Extremely well
- ☐ Very well
- ☐ Fairly well
- ☐ Not too well
- ☐ Not well at all

16. On the whole, how adequately is this co-op department meeting current community expectations regarding the services it provides? (Check ONE only)

- ☐ Extremely adequately
- ☐ Very adequately
- ☐ Moderately adequately
- ☐ Not so adequately
- ☐ Not adequately at all

17. All things considered, how realistic are the community expectations regarding the services provided by this co-op department? (Check ONE only)

- ☐ Extremely realistic
- ☐ Very realistic
- ☐ Moderately realistic
- ☐ Not so realistic
- ☐ Not realistic at all

18. At the present time, to what extent is this school or co-op department collaborating with other schools, co-op departments, or relevant services for the following purposes? (Check ONE only for each purpose)

Level of Collaboration

Very great Great Fair Small Not at all

To provide better
co-op services to
the community

To facilitate or
improve the work
of this co-op
department

To share useful
information about the
educational needs
of students

To establish or
maintain special
co-op facilities or
a regional system

To train co-op staff
and support personnel

19. Considering all the work-related contacts that the co-op staff have with each of the following, how satisfactory would you say are their contacts from the standpoint of accomplishing the work of this co-op department? (Check ONE for each contact)

Level of Satisfaction

	Completely satisfactory	Very satisfactory	Not so satisfactory	Not satisfactory	They have no contacts with this personnel
School Board					
Labour Organizations					
Employment & Immigration					
Co-op Advisory Committees					
Professional Co-op Associations					
Post-secondary Institutions					
Ministry of Education					

20. With approximately how many of the personnel from these outside groups (listed above) would you say the work-related contacts of the co-op department staff are tense or strained at the present time? (Check ONE only)

- ☐ Contacts with very few or none of these personnel are strained
☐ Contacts with a few of these personnel are strained
☐ Contacts with some of these personnel are strained
☐ Contacts with many of these personnel are strained
☐ Contacts with all or nearly all of these personnel are strained
☐ I don't know

E. RESOURCE ALLOCATION

21. Considering what this co-op department needs to provide high quality service to students, how sufficient would you say is the amount of each of the following resources? (Check ONE for each resource)

Amount of These Resources

	Completely sufficient	Very sufficient	Fairly sufficient	Not so sufficient	Not sufficient at all
Staffing for co-op					
Guidance personnel for counselling and timetabling					
Employers for job placements					
The amount of total funds allocated to co-op by the school					
The information received by co-op staff from other parts of the school					
The space (building space) and physical facilities belonging to the co-op dept.					

22. When you request the services, assistance, or support of others in the school (outside of the co-op department) how satisfactory are your requests met for each of the following?

Level of Satisfaction

	Completely satisfactory	Very satisfactory	Fairly satisfactory	Not so satisfactory	Not satisfactory at all
Services from the guidance personnel					
Secretarial assistance					
Cooperation or assistance from other departments					
Administration services or support					

Thank you for taking the time to complete this questionnaire. Please feel free to contact the researcher directly if you have any questions or suggestions.

Carol Thibault
1832 Florida Avenue
Ottawa, Ontario K1H 6Z1
(613) 521-8351

APPENDIX C
PROGRAM STRUCTURE INTERVIEW FORM

PROGRAM STRUCTURE INTERVIEW FORM

- 1 Name of School Board _____
- 2 Name of School _____
- 3 Contact Person _____ Phone _____
- 4 Size of school _____
- 5 Location of school Rural School _____ Urban School _____
- 6 Semestered _____ Traditional _____
- 7 Starting date of co-op program in the school _____
- 8 Total number of co-op students 1991-92 _____
- 9 Screening process Academic standing/ Interview/ Recommendation
- 10 Total number of co-op students participating in survey _____
- 11 Total number of teachers involved in co-op 1991-92 _____
- 12 Number of hours worked for one credit _____ hours
- 13 Type of co-op program Basic _____ General _____ Advanced _____
- 14 Grade level of co-op students Grade 10 _____ Grade 11 _____ Grade 12 _____ OAC _____
- 15 Work schedule for co-op Half days _____ Full days _____ Block Time _____
- 16 Number of work placements per student/year 1 _____ 2 _____ 3 _____ 4 _____ 5 _____
- 17 Designated related subject Cross curriculum/Guidance/ Other _____
- 18 Board coordinator Yes _____ No _____
- 19 School coordinator Yes _____ No _____
- 20 Co-op program literature available Yes _____ No _____

APPENDIX D

HLM Results for Student Inputs and Educational Efficiency: Supplementary Tables

Table D-1

Effects of Student Input Variables on COUN

Unconditional model			
Within-schools variance	7.785		
Between-schools variance	.452		
	Coefficient	SE	t
Conditional model			
Base	18.887*	.186	101.56
PRE-ACH	n.s.		
LEVEL	n.s.		
MOT	1.429*	.237	6.024
REAS	n.s.		
PART	n.s.		
VOL	.623*	.212	2.931
Within-schools variance	7.275		
Between-schools variance	.471		
Percentage within-schools variance explained	6.551		

* $p \leq .05$

NOTE: n.s. denotes that the coefficient is not statistically significant and therefore, is trimmed from the final model.

Table D-2

Effects of Student Input Variables on SUB

Unconditional model				
Within-schools variance	11.385			
Between-schools variance	.358			
		Coefficient	SE	t
Conditional model				
Base		16.311*	.188	86.897
PRE-ACH		.474*	.183	2.594
LEVEL		n.s.		
MOT		.941*	.292	3.210
REAS		-.201*	.067	-3.009
PART		n.s.		
VOL		n.s.		
Within-schools variance	10.875			
Between-schools variance	.367			
Percentage within-schools variance explained	4.80			

*p<.05

Table D-3

Effects of Student Input Variables on PREP

Unconditional model				
Within-schools variance	8.361			
Between-schools variance	.058			
		Coefficient	SE	t
Conditional model				
Base		18.885*	.125	150.834
PRE-ACH		n.s.		
LEVEL		n.s.		
MOT		1.304*	.247	5.269
REAS		n.s.		
PART		n.s.		
VOL		n.s.		
Within-schools variance	7.920			
Between-schools variance	.064			
Percentage within-schools variance explained	5.27			

*p<.05

Table D-4

Effects of Student Input Variables on JOB

Unconditional model				
Within-schools variance	21.092			
Between-schools variance	.001			
		Coefficient	SE	t
Conditional model				
Base		23.348*	.183	127.765
PRE-ACH		n.s.		
LEVEL		n.s.		
MOT		2.110*	.392	5.390
REAS		n.s.		
PART		n.s.		
VOL		1.190*	.351	3.392
Within-schools variance	19.831			
Between-schools variance	.049			
Percentage within-schools variance explained	5.979			

*p<.05

Table D-5

Effects of Student Input Variables on CLASS

Unconditional model				
Within-schools variance	15.862			
Between-schools variance	1.168			
		Coefficient	SE	t
Conditional model				
Base		19.639*	.286	68.725
PRE-ACH		n.s.		
LEVEL		n.s.		
MOT		.899*	.347	2.589
REAS		-.243*	.079	-3.092
PART		n.s.		
VOL		.771*	.309	2.498
Within-schools variance	15.295			
Between-schools variance	1.147			
Percentage within-schools variance explained	3.575			

*p<.05

Table D-6

Effects of Student Input Variables on VISIT

Unconditional model				
Within-schools variance	37.506			
Between-schools variance	4.799			
		Coefficient	SE	t
Conditional model				
Base		26.705*	.541	49.406
PRE-ACH		n.s.		
LEVEL		-1.160*	.427	-2.718
MOT		n.s.		
REAS		-.303*	.121	-2.508
PART		n.s.		
VOL		1.755*	.479	3.663
Within-schools variance	36.257			
Between-schools variance	4.848			
Percentage within-schools	3.330			
variance explained				

* $p < .05$

Table D-7

Effects of Student Input Variables on EVAL

Unconditional model				
Within-schools variance	21.936			
Between-schools variance	3.221			
		Coefficient	SE	t
Conditional model				
Base		22.763*	.436	52.181
PRE-ACH		.728*	.263	2.771
LEVEL		-.929*	.336	-2.767
MOT		n.s.		
REAS		n.s.		
PART		n.s.		
VOL		.927*	.369	2.515
Within-schools variance	21.408			
Between-schools variance	3.239			
Percentage within-schools variance explained	2.407			

*p<.05

APPENDIX E

HLM Results for Student Inputs and Student Satisfaction: Supplementary Tables

Table E-1

Effects of Student Input Variables on SCOUN

Unconditional model				
Within-schools variance	1.089			
Between-schools variance	.111			
		Coefficient	SE	t
Conditional model				
Base		3.388*	.084	40.200
PRE-ACH		n.s.		
LEVEL		n.s.		
MOT		.301*	.091	3.308
REAS		n.s.		
PART		n.s.		
VOL		n.s.		
Within-schools variance	1.072			
Between-schools variance	.111			
Percentage within-schools variance explained	1.561			

*p<.05

Table E-2

Effects of Student Input Variables on SSUB

Unconditional model				
Within-schools variance	1.157			
Between-schools variance	.043			
		Coefficient	SE	t
Conditional model				
Base		3.600*	.063	57.399
PRE-ACH		.151	.058	2.601
LEVEL		n.s.		
MOT		.3558*	.093	3.819
REAS		n.s.		
PART		n.s.		
VOL		n.s.		
Within-schools variance	1.121			
Between-schools variance	.044			
Percentage within-schools variance explained	3.111			

*p<.05

Table E-3

Effects of Student Input Variables on SPREP

Unconditional model				
Within-schools variance	.872			
Between-schools variance	.050			
		Coefficient	SE	t
Conditional model				
Base		3.939*	.062	63.365
PRE-ACH		.154*	.052	2.974
LEVEL		-.129*	.066	-1.951
MOT		.347*	.081	4.312
REAS		n.s.		
PART		n.s.		
VOL		n.s.		
Within-schools variance	.837			
Between-schools variance	.052			
Percentage within-schools variance explained	4.014			

*p<.05

Table E-4

Effects of Student Input Variables on SJOB

Unconditional model			
Within-schools variance	.974		
Between-schools variance	.042		
	Coefficient	SE	t
Conditional model			
Base	3.946*	.060	65.295
PRE-ACH	.166*	.053	3.105
LEVEL	n.s.		
MOT	.282*	.086	3.295
REAS	n.s.		
PART	n.s.		
VOL	n.s.		
Within-schools variance	.944		
Between-schools variance	.044		
Percentage within-schools variance explained	3.080		

* $p < .05$

Table E-5

Effects of Student Input Variables on SCLASS

Unconditional model			
Within-schools variance	1.372		
Between-schools variance	.096		
	Coefficient	SE	t
Conditional model			
Base	3.279*	.083	39.409
PRE-ACH	n.s.		
LEVEL	-.315*	.081	-3.888
MOT	n.s.		
REAS	n.s.		
PART	n.s.		
VOL	n.s.		
Within-schools variance	1.342		
Between-schools variance	.099		
Percentage within-schools variance explained	2.187		

* $p < .05$

Table E-6

Effects of Student Input Variables on SVISIT

Unconditional model			
Within-schools variance	1.075		
Between-schools variance	.104		
	Coefficient	SE	t
Conditional model			
Base	3.665*	.082	44.423
PRE-ACH	n.s.		
LEVEL	-.263*	.072	-3.668
MOT	n.s.		
REAS	n.s.		
PART	n.s.		
VOL	n.s.		
Within-schools variance	1.054		
Between-schools variance	.106		
Percentage within-schools variance explained	1.953		

*p<.05

Table E-7

Effects of Student Input Variables on SEVAL

Unconditional model			
Within-schools variance	1.014		
Between-schools variance	.044		
	Coefficient	SE	t
Conditional model			
.Base	3.788*	.062	61.416
PRE-ACH	n.s.		
LEVEL	-.147*	.070	-2.109
MOT	.268*	.088	3.048
REAS	n.s.		
PART	n.s.		
VOL	n.s.		
Within-schools variance	.996		
Between-schools variance	.046		
Percentage within-schools variance explained	1.775		

*p<.05

Table E-8

Effects of Student Input Variables on SNEED

Unconditional model			
Within-schools variance	.831		
Between-schools variance	.051		
	Coefficient	SE	t
Conditional model			
Base	4.141*	.063	65.741
PRE-ACH	.134*	.048	2.788
LEVEL	n.s.		
MOT	.514*	.077	6.667
REAS	n.s.		
PART	n.s.		
VOL	n.s.		
Within-schools variance	.766		
Between-schools variance	.057		
Percentage within-schools variance explained	7.822		

* $p < .05$

Table E-9

Effects of Student Input Variables on SBEN

Unconditional model				
Within-schools variance	.697			
Between-schools variance	.023			
		Coefficient	SE	t
Conditional model				
Base		3.180*	.047	67.650
PRE-ACH		n.s.		
LEVEL		n.s.		
MOT		.294*	.073	4.042
REAS		-.041*	.016	-2.470
PART		n.s.		
VOL		n.s.		
Within-schools variance	.672			
Between-schools variance	.023			
Percentage within-schools variance explained	3.587			

* $p < .05$

Table E-10

Effects of Student Input Variables on STELL

Unconditional model				
Within-schools variance	.285			
Between-schools variance	.042			
		Coefficient	SE	t
Conditional model				
Base		1.680*	.050	33.841
PRE-ACH		n.s.		
LEVEL		n.s.		
MOT		.316*	.045	6.970
REAS		-.032*	.010	-3.088
PART		n.s.		
VOL		n.s.		
Within-schools variance	.258			
Between-schools variance	.043			
Percentage within-schools variance explained	9.474			

*p<.05

Table E-11

Effects of Student Input Variables on SOC

Unconditional model				
Within-schools variance	.661			
Between-schools variance	.094			
		Coefficient	SE	t
Conditional model				
Base		3.063*	.075	41.026
PRE-ACH		.217*	.043	5.011
LEVEL		n.s.		
MOT		.273*	.069	3.943
REAS		n.s.		
PART		n.s.		
VOL		n.s.		
Within-schools variance	.621			
Between-schools variance	.095			
Percentage within-schools variance explained	6.051			

* $p < .05$

APPENDIX F

HLM results for Educational Efficiency and Student Satisfaction:
Supplementary Tables

Table F-1

Effects of Educational Efficiency Variables on SCOUN

Unconditional model				
Within-schools variance	1.089			
Between-schools variance	.111			
		Coefficient	SE	t
Conditional model				
Base		3.388*	.084	40.151
COUN		.057*	.015	3.943
SUB		n.s.		
PREP		n.s.		
JOB		n.s.		
CLASS		.050*	.011	4.388
VISIT		n.s.		
EVAL		.055*	.010	5.551
Within-schools variance	.847			
Between-schools variance	.120			
Percentage within-schools variance explained	22.222			

*p<.05

Table F-2

Effects of Educational Efficiency Variables on SSUB

Unconditional model				
Within-schools variance	1.157			
Between-schools variance	.043			
		Coefficient	SE	t
Conditional model				
Base		3.600*	.063	57.352
COUN		n.s.		
SUB		.079*	.012	6.620
PREP		n.s.		
JOB		n.s.		
CLASS		n.s.		
VISIT		n.s.		
EVAL		.064*	.008	7.454
Within-schools variance	.957			
Between-schools variance	.050			
Percentage within-schools variance explained	17.286			

*p<.05

Table F-3

Effects of Educational Efficiency Variables on SPREP

Unconditional model				
Within-schools variance	.872			
Between-schools variance	.050			
		Coefficient	SE	t
Conditional model				
Base		3.940*	.063	63.023
COUN		n.s.		
SUB		.032*	.011	2.857
PREP		.052*	.013	3.970
JOB		n.s.		
CLASS		n.s.		
VISIT		n.s.		
EVAL		.048*	.007	6.091
Within-schools variance	.747			
Between-schools variance	.056			
Percentage within-schools variance explained	14.335			

*p<.05

Table F-4

Effects of Educational Efficiency Variables on SJOB

Unconditional model				
Within-schools variance	.974			
Between-schools variance	.042			
		Coefficient	SE	t
Conditional model				
Base		3.944*	.062	64.120
COUN		n.s.		
SUB		n.s.		
PREP		.067*	.014	4.956
JOB		.062*	.008	7.080
CLASS		n.s.		
VISIT		n.s.		
EVAL		.036*	.008	4.534
Within-schools variance	.740			
Between-schools variance	.053			
Percentage within-schools variance explained	24.025			

*p<.05

Table F-5

Effects of Educational Efficiency Variables on SCLASS

Unconditional model				
Within-schools variance	1.372			
Between-schools variance	.096			
		Coefficient	SE	t
Conditional model				
Base		3.280*	.083	39.471
COUN		n.s.		
SUB		.050*	.014	3.656
PREP		n.s.		
JOB		n.s.		
CLASS		.069*	.013	5.365
VISIT		.038*	.008	4.773
EVAL		n.s.		
Within-schools variance	1.101			
Between-schools variance	.106			
Percentage within-schools variance explained	19.752			

*p<.05

Table F-6

Effects of Educational Efficiency Variables on SVISIT

Unconditional model			
Within-schools variance	1.075		
Between-schools variance	.104		
	Coefficient	SE	t
Conditional model			
Base	3.664*	.082	44.419
COUN	n.s.		
SUB	n.s.		
PREP	n.s.		
JOB	n.s.		
CLASS	n.s.		
VISIT	.054*	.007	7.429
EVAL	.045*	.009	4.773
Within-schools variance	.849		
Between-schools variance	.113		
Percentage within-schools variance explained	21.023		
*p<.05			

Table F-7

Effects of Educational Efficiency Variables on SEVAL

Unconditional model			
Within-schools variance	1.014		
Between-schools variance	.044		
	Coefficient	SE	t
Conditional model			
Base	3.788*	.062	61.294
COUN	n.s.		
SUB	.037*	.010	3.551
PREP	n.s.		
JOB	n.s.		
CLASS	n.s.		
VISIT	n.s.		
EVAL	.104*	.008	13.840
Within-schools variance	.730		
Between-schools variance	.054		
Percentage within-schools variance explained	28.008		

*p<.05

Table F-8

Effects of Educational Efficiency Variables on SNEED

Unconditional model			
Within-schools variance	.831		
Between-schools variance	.051		
	Coefficient	SE	t
Conditional model			
Base	4.142*	.063	66.195
COUN	n.s.		
SUB	n.s.		
PREP	n.s.		
JOB	.115*	.006	17.753
CLASS	n.s.		
VISIT	n.s.		
EVAL	n.s.		
Within-schools variance	.552		
Between-schools variance	.063		
Percentage within-schools variance explained	33.574		
*p<.05			

Table F-9

Effects of Educational Efficiency Variables on SBEN

Unconditional model			
Within-schools variance	.697		
Between-schools variance	.023		
	Coefficient	SE	t
Conditional model			
Base	3.183*	.0457	69.676
COUN	n.s.		
SUB	n.s.		
PREP	n.s.		
JOB	.107*	.006	18.011
CLASS	n.s.		
VISIT	n.s.		
EVAL	n.s.		
Within-schools variance	.460		
Between-schools variance	.028		
Percentage within-schools variance explained	34.003		

* $p < .05$

Table F-10

Effects of Educational Efficiency Variables on STELL

Unconditional model			
Within-schools variance	.285		
Between-schools variance	.042		
	Coefficient	SE	t
Conditional model			
Base	1.680*	.049	33.948
COUN	.037*	.007	4.887
SUB	n.s.		
PREP	n.s.		
JOB	.039*	.005	8.536
CLASS	n.s.		
VISIT	n.s.		
EVAL	n.s.		
Within-schools variance	.229		
Between-schools variance	.043		
Percentage within-schools variance explained	19.649		

*p<.05

Table F-11

Effects of Educational Efficiency Variables on SQC

Unconditional model				
Within-schools variance	.661			
Between-schools variance	.094			
		Coefficient	SE	t
Conditional model				
Base		3.063*	.075	41.104
COUN		.036*	.012	2.998
SUB		n.s.		
PREP		.029*	.011	2.547
JOB		.019*	.007	2.747
CLASS		n.s.		
VISIT		.018*	.006	3.240
EVAL		.048*	.007	6.544
Within-schools variance	.471			
Between-schools variance	.099			
Percentage within-schools variance explained	28.744			

*p<.05

APPENDIX G
ETHICS COMMITTEE APPROVAL



EVALUATION OF THE UNIVERSITY
HUMAN RESEARCH ETHICS COMMITTEE (UHREC)

In accordance with the Terms of Reference established by the Senate of the University of Ottawa, the University Human Research Ethics Committee (UHREC) examined the project "Organizational Effectiveness of Cooperative Education" submitted by Carol Thibault, student from the Faculty of Education, working under the supervision of Dr. Daniel Soucie, Department of Human Kinetics, Faculty of Health Sciences, University of Ottawa.

This project meets the ethical standards set out by the University of Ottawa.

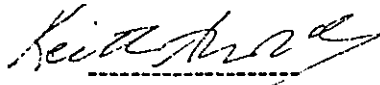
MEMBERS OF THE COMMITTEE

NAMES	Position held	Discipline
Keith Arnold	Chairman	Philosophy
Edmond Rossier	Membre	Microbiology
Roger Gauthier	Membre	School of Human Kinetics
Nicole Kean	Membre at large	Law
Jean Farrall	Ex-Officio	Research Services
Marie-Claire Pommez	Secretary	Research Services

SIGNATURES

January 23, 1992

Date


Chairman


University Representative