

AN ABSTRACT OF THE DISSERTATION OF

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Title: Partnerships at the Center for Advanced Learning; A Regional Educational Reform Initiative.

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The purpose of this research study is to investigate and gain understanding of the factors contributing to development of the Center for Advanced Learning (CAL), a regional collaborative educational reform project and the partnerships that emerged from that process. The development process and partnerships are examined from a systems thinking perspective. This study was guided by the following research questions: 1) Why did representatives from the private sector choose to partner with the CAL? 2) Why did some potential partners choose not to partner with the CAL? 3) What are the systems components that contributed to developing this collaborative educational reform project? 4) How do elements of the developmental systems encourage sustained progress? 5) How do educational and private sector systems interact and contribute to development of this project?

The study participants included high school and college faculty and administrators, university faculty, and representatives from the private sector and

governmental agencies. A total of 17 interviews were conducted and 469 CAL related documents were cataloged and analyzed.

The overall findings indicate the project evolved through self-organization and self-regulation. The conclusions are: 1) the ability to sustain development of CAL as an educational reform project in a living systems paradigm rather than from a linear and directed approach required flexibility, understanding, trust, confidence, and time to allow autopoiesis to occur, 2) CAL partnerships evolved in a dynamic manner compared with partnerships described in the literature, 3) motivations to partner with CAL were the result of environmental factors and strange attractors, and 4) adaptive leadership in development of the CAL played an important role. Implications of the study suggest that: 1) systems awareness considerations by participants provides an increased degree of developmental flexibility, 2) the manner in which a vision is disseminated is key to developing momentum, and 3) curriculum development in a complex environment could be managed with systems considerations.

Partnerships at the Center for Advanced Learning:
A Regional Educational Reform Initiative

by
Joseph H. Dunlap

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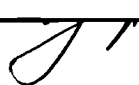

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**Partnerships at the Center for Advanced Learning:
A Regional Educational Reform Initiative**

CHAPTER 1

INTRODUCTION

This study examines and describes factors contributing to the development of the Center for Advanced Learning (CAL), and the willingness of the private sector to partner with the Center. The CAL is a regional collaborative response to state and national educational reform initiatives. The study attempted to provide better understanding of the factors contributing to the development of this partnership project using systems theory as a framework for analysis.

In Oregon, consistent with national educational reform trends, there is an effort underway to promote and encourage progressive and innovative educational reform by a variety of stakeholders, including the private sector. Increased accountability and linkages to the world of work are also movements gaining momentum in communities throughout the nation. As a result of these stimuli, the State of Oregon has adopted charter school legislation, introduced the Certificates of Initial and Advanced Mastery for grades 9-12, and encouraged the development of partnerships that create a well prepared workforce.

Several drivers calling for and providing impetus for educational reform in the State of Oregon are: 1) a public demand for increased accountability in the educational systems and an expectation of increased student performance; 2) the Certificate of Initial Mastery (CIM) delivered in the 9th and 10th grades, demonstrating competence in writing, mathematics and science skills; 3) the Certificate of Advanced Mastery (CAM), offered in the 11th and 12th grades, providing students with career orientation pathways in six disciplines; 4) the ability of local school districts to establish charter schools; 5) unacceptable high school dropout rates; and 6) increasing minority populations with equitable educational expectations (Center for Educational Reform, 2001; Oregon Business Council, 2000; Oregon School Boards Association, 1999).

In contrast, the national education reform initiatives include: 1) increasing schools of choice; 2) instituting academic standards and improving curriculum, particularly in the areas of mathematics and science; 3) providing school-to-work pathways for students; 4) instituting quality management practices such as Malcolm Baldrige criteria; 5) promoting charter schools; 6) providing alternative teacher and pupil certification; and 7) removing barriers for students with disabilities (Business Coalition for Education Reform, 2001; College of Education, 2001).

The Certificate of Advanced Mastery and the ability to establish charter schools result in both opportunity and flexibility for implementation of local and regional educational reform initiatives. The State of Oregon has established six

CAM strands or career pathways for 11th and 12th graders, which are to be implemented throughout Oregon by 2004. These strands include arts and communications, business and management, health sciences, human resources, industrial and engineering systems, and natural resource systems (Oregon Department of Education, 2001a).

In response to Oregon Department of Education CAM implementation requirements, recent state and federal educational reform and accountability initiatives, and a desire to develop connectivity and continuity in program content, Mt. Hood Community College Regional Educational Consortium, along with other education and private sector partners, embarked on the establishment of the Center for Advanced Learning. Participating high school districts embraced the charter school concept and worked collaboratively on a proposal to operate the Center for Advanced Learning as a charter school. The goals of the Center are to increase student learning and achievement, increase the number of students pursuing advanced specialization within CAM pathway areas, and to become a regional education-private sector partnership model for the 21st century.

The CAL implements educational reform initiatives, which include the delivery of meaningful career pathway-related curricula that meets private sector workforce development needs. CAL also provides linkages to higher education and the world of work for students through education and private sector partnerships. Four school districts combined fiscal and human resources to create

an economy of scale to develop and deliver these career pathways that would otherwise be too expensive to offer independently.

Historically, education-private sector partnerships were limited in scope, providing people, equipment or project support to educational institutions for limited periods of time. Industry motivations were primarily public relations, making a good-faith effort in community involvement and occasional tax relief for donations of equipment (Lankard, 1995).

Increasingly, the private sector has moved toward partnerships related to broader educational reform issues. Driving this change is the perception that workers are not adequately prepared with the skills required for today's industry, especially "employability skills" such as interpersonal skills and team skills. Thus, education-private sector partnerships have increased in scope to include curriculum development, integration of academic and technical skills, and alternative funding strategies (Business-Higher Education Forum, 2001; Gonzales, 2000; Hudis, 2000). Often education-private sector partnerships are hampered by differences in culture, processes, and practices. These differences can adversely affect the relationships among partners. While this was not as critical when partnerships were limited in scope, these newly evolving complex relationships require increased care and nurturing to be successful and mutually beneficial.

The theoretical framework of this study was drawn from the research and literature on educational reform initiatives, systems theory, and educational-private sector partnerships. The research design was a case study approach that involved

in-depth analyses of interviews of educators and representatives from the private sector who at some point participated in the design, development and/or implementation process; examination and analyses of documents from the CAL project; and observations of meetings and interactions between project personnel and private sector representatives (Creswell, 1998).

The CAL is located in Gresham, Oregon, part of the greater Portland metro area. The region served by this project includes east Multnomah County, which includes seven school districts and one community college district. Representative stakeholders are from secondary and postsecondary education, the private sector, students and parents, and community and governmental agencies. The Center serves as a comprehensive state and, potentially, national model consistent with educational reform initiatives at the state and national level. The Center will also serve as a regional resource for advanced manufacturing and pre-engineering, health sciences, and information technology education.

The vision for the CAL project is to implement and validate processes and procedures for creating innovative educational practices. There are six overarching goals for this project (Lesh, 2000b):

1. Provide the foundation for an economy of scale that allows three [four eventually partnered] school districts to offer programs they could not offer individually.
2. Develop an integrated curriculum that incorporates both contextualized learning and authentic assessment.

3. Provide a continuum of opportunity by using the curricula to connect high school, college, university, and work.
4. Increase student preparation for the job market.
5. Increase student performance in academic subjects.
6. Increase student retention and persistence.

Statement of the Problem

Development of education-private sector partnerships is not new but their characteristics, frequency of implementation, and motivations of partners are changing. The shifting nature of these relationships, which includes private sector involvement in, and influence of, educational reform initiatives, is an emerging phenomenon and uncharacteristic of earlier education-private sector partnerships. Development of these partnerships in a systems theory context is not well documented nor understood. A better understanding of the interconnectedness between education and private sector systems provides valuable insight into partnership development processes and benefit those organizations seeking to enter into educational-private sector partnerships.

For decades partnerships have occurred in research and development areas at universities, and in contract training and the delivery of social services in community colleges. Private sector partnerships at the high school level were usually limited to the donation of equipment or sponsorship of a specific activity. The Committee for Economic Development, in their report, *The Employer's Role in*

Linking School and Work, recently indicated that the nature of these relationships has changed because, "...education and skills have become a more stark dividing line between success and failure in the new labor market" (Committee for Economic Development, 1998, p. 1). Emphasis by state and federal agencies and local communities on educational reform initiatives suggests there should be stronger ties linking student outcomes to the world of work through partnering initiatives.

More students than ever before are participating in private-sector-sponsored learning opportunities in response to these school-to-work reform initiatives. Imel (2001), in her brief for the National Dissemination Center for Career and Technical Education, states: "...because of the perceived disjuncture between what is being taught and assessed in schools and what is actually required in the workplace, the types of school-business relationships that worked in the past are inadequate; new infrastructures are needed" (p. 1). The current trend in partnership development is toward collaborations that address educational improvement and through educational reform initiatives (Otterbourg, 1998).

The School to Work Opportunities Act (STWOA) of 1994 was implemented as a result of two reports from the Department of Labor: 1) *Learning a Living: Secretary's Commission on Achieving Necessary Skills (SCANS)* (1991); and 2) *Learning a Living: Blue Print for High Performance* (1992). The STWOA contained three core elements: school-based learning, work-based learning, and connecting activities. The school-based learning component required a shift in the

philosophy of what constitutes education. The work-based component included extended learning opportunities including, internships, job shadowing, mentoring, and community service. The third component, which was viewed as critical to the success of school to work, suggested that schools cannot do it alone and, therefore, partnerships and linkages to communities and the private sector were essential (APA, 2002). Potential partnerships result in a myriad of opportunities to develop linkages and connectivity that significantly benefit students. The STWOA's emphasis is on career exploration and awareness as well as high academic and occupational skill attainment (Maddy-Bernstein, 2000).

On the surface it appeared that the sole purpose of STWOA was to promote career preparation. While career preparation was important, there were three other purposes: 1) work-based learning presents students with a sense of real world applications, and retention and understanding are promoted with hands-on experiences; 2) STWOA promotes collaboration between employers and education, where in many states governance of school to work councils must be numerically dominated by private sector employers; and 3) STWOA was intended as a catalyst for initiating educational reform initiatives (Hollenbeck, 1997).

The effectiveness of the STWOA has been questionable. Hollenbeck (1997) identifies four problematic areas with STW implementation: 1) states are taking considerably different approaches to implementation, while Oregon is generally accepted as the most ambitious by adopting state wide Certificates of Initial and Advanced Mastery; 2) progress in implementing STW programs has

been focused on career awareness activities; 3) work-based learning can be seriously mishandled without proper supervision, coordination, and implementation of appropriate learning objectives; and 4) successful implementation requires leadership and investment in professional development.

Stern, Finkelstein, Stone, Latting, and Dornsife (1994) indicate that in a review of the effectiveness of STWOA, some programs show moderate success while others show negative results. The 1997 progress report of the STWOA legislation reported only two percent of high school students indicated they actually participated in STW activities. He further indicates that not enough attention or resources were devoted to teacher training and the levels of school involvement in the STW were fairly low. A major concern was there was not a large level of parent involvement in STW activities.

Although much has been written about education-private sector partnerships, little is understood or published about the development of partnerships in the context of the design, development, and implementation life-cycle of educational reform projects. It is suggested that if educators and representatives of the private sector better understood partnership motivations and how systems components influence the likelihood of potential partnering, those seeking education-private sector partnerships could employ more efficient and timely strategies (Wills & Kaufmann, 1997).

The Oregon Business Council (2000), established in 1985 as a nonprofit, nonpartisan, and independent organization of more than 40 of Oregon's top

business leaders, established: 1) linkage between education, 2) workforce quality, 3) economic competitiveness, and 4) social cohesion as a K-12 and higher education priority. In 2000 the Council published an assessment of educational reform initiatives in the K-12 system, and stated the five most important themes for future educational reform initiatives are:

Reconfirm and communicate the vision for education among all stakeholders, particularly focusing on teachers as key drivers for reform.

Continue to implement Oregon's evolving standards and assessment system, and finish and align the Certificate of Advanced Mastery with these standards and assessments.

Create a new budget development and adoption process that ties funding to performance expectations for schools and funds specific programs needed to adopt the new system.

Focus on the underlying governance system for public K-12 education including re-evaluating the roles of individual schools, districts, education service districts, the Department of Education, the governor, and the legislature.

As part of the review on governance, examine the range of educational models, including charter schools, contract schools, and prototype secondary schools. (p. 4)

Purpose of the Study

The purpose of this study was to investigate the Center for Advanced Learning developmental process and gain understanding of the factors contributing to the progress of this partnership project. This study developed a life-cycle framework using systems theory as the basis of analysis and integrated the

experiences of representatives from participating educational institutions and the private sector into this framework. This study also identified critical benchmarks in the developmental life-cycle of an educational project, factors that contribute to the willingness of the private sector to partner with the CAL, and when in the life-cycle the private sector affiliated and partnered with the Center for Advanced Learning. It is anticipated that a model will emerge that provides a framework for understanding the nature of these complex relationships and identifies critical components that influence education-private sector partnership development.

Significance of the Study

The significance of this study is that it results in understanding the elements, systems, and processes that emerged in the developmental process of the Center for Advanced Learning. As the nature and characteristics of partnerships evolve, understanding those systems components in the context of an educational reform project provides insight and leverage to educators and representatives of the private sector as well as other educational stakeholders interested in developing education private sector partnerships.

Knowing why the private sector would affiliate with an educational reform project, and when they are more likely to partner, results in a strategic advantage for educators trying to build partnerships. That knowledge increases the potential for developing successful and effective partnerships and enduring relationships. This study suggests an economy of effort for potential education-private sector

partners by identifying important factors that influence the likelihood of successful partnering and how they interact from a systems theory perspective. Forearmed with this information, educational institutions and the private sector interested in developing partnerships can optimize their potential at appropriate times and leverage points within developmental systems rather than operating with an ongoing, unfocussed strategy.

From a systems perspective, leverage is an important concept that also provides an economy of scale. Senge (1990) in *The Fifth Discipline* indicates that in a living system,

...this leverage can lead to significant enduring improvements. Often, leverage follows the principles of economy of means: where the best results come not from large-scale efforts but from small-well focused actions... But the leverage in most real-life systems, such as most organizations, is not obvious to most of the actors in those systems. They don't see the "structures" underlying their actions. (p. 114)

This study provides educators and representatives of the private sector leverage by understanding factors that influence the potential for education-private sector partnerships. It also contributes to the limited body of knowledge pertaining to the role of systems thinking in the development of partnerships and educational reform projects.

It is expected that an increased understanding of what factors enhance the probability of success for partnerships will also increase insight into which elements should be considered as evaluation components of partnerships. With the growing emphasis on accountability from educational stakeholders, identification

of pertinent evaluation components that contribute to the long-term health and continuous improvement of partnerships becomes increasingly important.

Research Questions

Five major research questions were addressed in this study and it was anticipated that other research questions would emerge as the study progressed.

1. Why did representatives from the private sector choose to partner with the CAL? The motivations and expectations that affected development of these relationships were examined.
2. Why did some potential partners choose not to partner with the CAL? The motivations of private sector representatives of potential partners that choose not to partner with the CAL, along with possible contributing conditions, were examined.
3. What are the systems components that contributed to developing this collaborative educational reform project? A timeline outlining the three years of CAL development were examined, development processes documented, and key decision points identified.
4. How do elements of the developmental systems encourage sustained progress? It was anticipated that key components within developmental systems would be identified which encouraged sustained developmental progress.

5. How do educational and private sector systems interact and contribute to the development of this project? The systems dynamics which contribute to the success or failure of a project of this nature were identified.

Delimitations of the Study

This study focused on the relationship between CAL and potential partners and the emergent regional private sector, education, and governmental partnerships by examining experiences of participants taking part in the CAL developmental process. More broadly, this study examined perspectives and motivations regarding why potential partners may or may not decide to partner. This study sought to describe those partnering experiences and those systems which contributed to success of the project in the context of the CAL development process.

Limitations of the Study

This study was not intended to be generalizable to all education-private sector partnership situations or conditions. Rather, it was intended to identify those elements of importance in establishing education-private sector partnerships which may be useful intelligence tools for educational institutions seeking to develop long-term mutually beneficial relationships with the private sector. This study was conducted in the Pacific Northwest and may be beneficial to those organizations with similar demographics and goals for collaborative educational reform projects.

Researcher Disclosure

This researcher is employed as the Vice President for Instruction at Clover Park Technical College. During the study this researcher was employed by Mt. Hood Community College as Dean of Science and Industrial Technology, responsible for all science, applied science, industrial, and apprenticeship programs. He has spent the past thirty years developing and delivering training and education programs for organizations such as the Department of Defense, the Federal Aviation Administration, University of Wisconsin-Whitewater, and Western Michigan University.

This researcher was involved in early CAL discussions conceptualizing how the region could best respond to and implement state and federal educational reform initiatives to improve educational opportunities for students and how students could be better connected to the world of work. As the project continued to develop with more formalized leadership, this researcher became more narrowly focused on the development of the pre-engineering and advanced manufacturing curriculum. This researcher continues to participate only in the pre-engineering and advanced manufacturing curriculum development process.

It has been this researcher's experience that education-private sector partnerships are beneficial when they are managed well and there is mutual benefit for all stakeholders. Conversely, these partnerships are mediocre to disastrous when mismanaged, ulterior agendas are promoted, or when cultures and motivations are misaligned. This researcher has participated in the development

and implementation of university and community college private sector partnerships that have produced significant notoriety, improved student performance, and major financial and cost effective benefits for stakeholders by providing high quality curricula that meets the needs of the private sector.

Further, this researcher has come to believe the purpose of research is to inform the researcher and subsequent readers by providing a foundation to assist in the decision-making processes. The goal of science from a broad positivist epistemological perspective is to seek truth and explain the world we live in from a mechanistic cause and effect paradigm. On the other hand, a post-positivist recognizes that all observation is fallible and has error, and researchers bring their own perspectives and create interpretations, thereby creating approximate knowledge that is revisable. In systems thinking, approximate knowledge is the best we can achieve because of the dynamic nature of systems. Investigating, observing, and describing evolving systems using a qualitative research approach introduces researcher perspective; however, it creates context as well.

This researcher's expectation for achieving trustworthiness in this qualitative study is to implement several strategies that address credibility, dependability, confirmability, and transferability of the research through multiple fallible perspectives (Creswell, 1998; Guba, 1981; Lincoln & Guba, 1985; Patton, 1990; Stake, 1995; Trochim, 2000). The trustworthiness of this research will be addressed in more depth in Chapter 3.

Definition of Terms

Affiliation—The act of becoming closely connected to, or associated with, another individual or organization, short of identifying and pursuing mutually beneficial goals.

Autopoiesis—The distinctive organization of living organisms. It is the ability of a living organism (cognitive system) to self-generate, self-organize and self-regulate. “It is a network of production processes, in which the function of each component is to participate in the production or transformation of other components in the network” (Capra, 1996, p. 98).

Business and industry—Business and industry are terms used interchangeably to describe the private economics sector in this study.

Center for Advanced Learning (CAL)—A regional collaborative project between secondary and post-secondary educational institutions and private sector partners whose purpose is to implement educational reform initiatives that create career pathways and higher education opportunities, and serve to raise student and system performance (Lesh, 2000).

Certificate of Advanced Mastery (CAM)—Oregon State educational reform initiative that requires secondary schools to deliver six career pathway curricula to grade eleven and twelve students. CAM prepares students for successful transitions to postsecondary schooling, employment, and adult responsibilities. CAM must be implemented in Oregon by 2004 (Oregon Department of Education, 2001a).

Charter School—Charter schools are nonsectarian public schools of choice that operate with freedom from many of the regulations that apply to traditional public schools. The “charter” establishing each school is a performance contract detailing the school’s mission, program, goals, students served, methods of assessment, and ways to measure success (West Ed, 2000).

Connectors—Nodes with an anomalously large number of links. They are present in very diverse complex systems (Barabasi, 2002).

Education-private sector partnership—A formalized relationship between an educational entity and the private sector, in which mutually beneficial goals are formally established.

Leverage—A small action in a living system that can potentially produce large results (Senge, 1990).

Life-cycle—Phases of development used to describe a project. The project life-cycle defines the beginning and the end of a project and the phases in between (Project Management Institute, 2000).

Information nodes—An information linking or dissemination point within a system.

Multi-dimensionality—The ability to see complementary relationships in opposing tendencies within a system. The mutual interdependence of these opposing relationships is represented as a continuum of possibilities (Gharajedaghi, 1999).

Partnership—A relationship that exists between entities that collaboratively pursue mutually agreed upon goals.

Private sector—Market-oriented, for-profit enterprises or individual entrepreneurs, trade associations, business group associations, cooperative and worker-owned enterprises, and other community or neighborhood-owned enterprises (Inter-American Foundation, 2001).

Strange attractors—Think of them as magnets that draw a complex adaptive system in a particular direction, either attracting or repelling system components. They arise from the interaction between an organism and its environment. Strange attractors, for example, inform people through networks and nodes and alter what people know and how they behave. When multiple nodes within a system align with one another, they coalesce into a pattern. New behavior shapes the ends, which in turn alters the future (Pascale, Millemann, & Gioja, 2000).

Systems theory—“A way of thinking about, and a language for describing and understanding the forces and interrelationships that shape the behavior of systems” (Senge, Kleiner, Roberts, Ross, & Smith, 1994, p. 6).

System—A system is a set of components together with relationships between the components and between their attributes which result in an integrated whole whose essential properties arise from the interaction between those relationships (Capra, 1996; Weinberg, 2001). A system is often defined by boundaries in order to describe its essential characteristics; however, all systems are ultimately related.

Summary

Recently, there have been increased pressures from stakeholders for education reform in the secondary system, which in turn has led to state and federal legislation. Among the drivers for this change are: 1) a public demand for increased accountability in the educational systems and an expectation of increased student performance accountability, 2) increasing schools of choice, including establishment of charter schools, 3) instituting academic standards and improving curriculum, particularly in the areas of mathematics and science, and 4) providing school-to-work pathways for students. In response to those demands the State of Oregon has implemented: 1) the Certificate of Initial Mastery (CIM) to measure success in grades 9 and 10, 2) the Certificate of Advanced Mastery (CAM) for proficiency demonstrated in one of six career pathways for grades 11 and 12, and 3) adoption of charter school legislation.

In response to these measures and the desire to: 1) develop a continuum of opportunity for students, 2) address unacceptable high school dropout rates, and 3) increase minority populations with equitable educational expectations, three individuals met and suggested creating a joint partnership among local school districts, the district community college, and the private sector to meet those needs. This placed in motion a series of meetings, discussions, and initiatives that over the next five years would develop a regional strategy to provide increased student opportunities, while addressing regional workforce development needs.

This study follows the development process for this regional initiative that resulted in the Center for Advanced Learning in Gresham, Oregon. The Center developed into a different organization than what was initially envisioned. This case study examines partnerships and dynamics of the project as it developed through the experiences of participants, analysis of documents, and field observations.

This study is organized into five chapters: Chapter 1 provides an overview of the study, including a description of the purpose and significance of the study. Chapter 2 consists of a review of the literature focusing on: 1) the historical context of education-private sector partnerships, 2) education-private sector partnership characteristics and development strategies, and 3) systems theory. Chapter 3 describes: 1) the setting for the study, 2) the methodology to be used for this case study, 3) the manner in which data will be gathered, coded, and managed, and 4) trustworthiness of the research. Chapter 4 presents data from: 1) participant experiences articulated through their quotes and thick descriptions, 2) analysis of documents presented primarily in tables and figures, and 3) field observations. Chapter 5 presents: 1) conclusions of the research, 2) implications of findings, and 3) recommendations for further research.

CHAPTER 2

LITERATURE REVIEW

General

The literature review focuses on four broad bodies of knowledge pertaining to education legislation, education reform, education-private sector partnership practices, and systems theory to inform the researcher about characteristics of successful education-private sector partnerships, criteria for establishing those partnerships, techniques and implementation strategies, and evaluation criteria for education-private sector partnerships. Systems theory provides a framework for understanding the components that influence partnership and project development. Review of this literature is divided into the following areas:

- Historical perspectives were examined to give context in which partnerships have evolved. Legislation has had an indirect but significant impact on the development of education-private sector partnerships. The nature of these partnerships has slowly evolved from simplistic one-on-one arrangements providing a conduit for resources and the benefit of community goodwill to complex partnerships involving multilevel partners jointly pursuing educational reform initiatives.

- Characteristics and types of successful education-private sector partnerships are examined. What emerge from these model education-private sector partnerships are common themes that result in a compilation of those elements viewed as critical to long-term mutually beneficial relationships.
- Systems theory provides the framework for understanding how components of CAL and private sector systems interact and dynamically influence seemingly unrelated events. Systems theory provides the language to describe relationships that cannot be described by simple linear cause and effect relationships.
- Trends in education-private sector partnerships are reviewed, providing insights into the direction private-sector priorities are supporting national educational reform efforts. Education-private sector partnerships unique to the Pacific Northwest are reviewed.

The literature on education-private sector partnerships and educational reform form the underlying foundation from which assumptions and research questions have been developed for this study. The concept of education-private sector partnerships conjures up a variety of perceptions for stakeholders depending on experiences, mental model, and knowledge of partnerships. To the educational administrator it may mean increased resources and opportunities for students—or yet another educational fad to deal with. To the business partner it may mean having the ability to help shape the future workforce, increased community

recognition, the ability to participate and influence local or regional educational reform initiatives—or another project that diverts focus from “bottom line” efforts. For the student it may mean increased learning opportunities through structured work experiences, ready access to the job market, the opportunity to gain work skills—or yet another hoop to go through in pursuit of a diploma. Partnerships to the community may mean increased economic development opportunities—or yet another entity meddling in educational reform initiatives. To the politician it may mean increased public relation opportunities—or relief from the public pressure for additional resources. To the teacher it may mean increased professional development opportunities—or undue pressure and influence from industry on well-entrenched programs. To the parent it may mean increased job related opportunities for their children—or it may be a distraction impeding the realization of their vision for their children. Regardless of one’s view, education-private sector partnerships are proliferating, and do provide windows of opportunity or opportunity for failure for all.

The paradox is that the aforementioned perceptions convey a sense of opportunity as well as concern for education-private sector partnerships. In a classic sense, partnerships are often described as formal agreements between joint business partners (G. & C. Merriam Company, 2000). In this context, concepts of shared vision, mutual benefit, responsiveness, collaboration, governance, and educational reform are lost. An example of an education-private sector partnership

definition that captures this paradox of opportunity while warning stakeholders about impending difficulties related to cultural differences indicates:

Partnerships are characterized by an exchange of ideas, knowledge and resources. Partners form a mutually rewarding relationship with the purpose of improving some aspect of education. The relationship must be based on the identification and acceptance of compatible goals and strategies. In addition, the partners should respect the difference in each other's culture and style, striving to apply the best of both worlds to achieve established goals (Regional Education Laboratory, 1986, p. 5).

The State of Iowa defined partnerships in a school-to-work context as:

...an agreement between a business, labor, government, or community organization and an education institution to work together on activities that will better prepare students for the workplace and to help develop a highly skilled workforce, (Weinstein, 1995, p. 7).

Although there are a myriad of definitions, characteristics, and perspectives about partnerships, for the purpose of this study a partnership is described as a relationship that exists between entities that collaboratively pursue mutually agreed upon goals. More specifically, a partnership that supports the development of the Center for Advanced Learning is an agreement [verbal, written or implied] between two or more entities that supports the accomplishment of CAL goals.

Historical Context

Early education-private sector partnerships were developed to foster school and community cooperation and improve the image of industry in the community. At the high school level, education-industry partnerships were usually limited to

donations of equipment or sponsored events. At the community college level, partnerships with industry usually took the form of contract training or other short-term agreements. By the latter part of the last century, however, the nature of these partnerships changed. Lankard (1995) in ERIC Digest No. 156, *Business/*

Education Partnerships, states that:

In the early 1980s, school reform reports called for changes that would ultimately transform the nature of education and business partnerships. Schools were faced with the need for educational reform measures that would better prepare a diverse student population for higher order thinking and reasoning skills required in an increasingly knowledge-based, service driven economy. Businesses were faced with the threat of an inadequately prepared workforce that would jeopardize their competition with other industrialized nations (p. 1).

Motivations to develop these early partnerships varied greatly according to the needs of both parties. Common benefits for industry in partnering included workforce development, financial benefits, sharing experts, political gain, and prestige. However, the mission, culture, organizational structure, motivations, and philosophy of higher education were often in conflict with industry (Gonzales, 2000). Since essential variables differed widely from one relationship to another, potential partners began affiliation with trepidation and concern that often precluded advancing the relationship to the more formalized partnership level.

Private sector involvement in the public school system has long existed, particularly in governance. As early as the 1860s, the New York Chamber of Commerce had representatives on the board of the Merchant Marine Technical School, which was operated by the public school system. In the first half of the

20th century, industry involvement in education became increasingly pervasive, with the majority of school board members coming from the ranks of business professionals (Cowan, 1994).

Federal Legislation

Early legislation in support of vocational and agricultural programs gave focus and impetus that began to encourage closer relationships between education and the private sector. Although the primary purpose of this legislation was to provide funding to improve agricultural and vocational education, the indirect result was to create opportunities for education to more closely link with the private sector. This early legislation did not mandate specific actions or relationships with regard to the private sector; however, the embedded economic incentives called for preparing highly skilled employees for useful employment (Rezin, 1998).

The Morrill Act of 1862 addressed a need that was not being met by educational institutions by providing each state with 30,000 acres of public land for each congressman. That land could be sold to create funds for agricultural and mechanical colleges. One hundred years later, 68 land grant institutions enrolled 20% of the nation's undergraduates. The Second Morrill Act of 1890 resulted in additional funds for black land grant colleges (Kalpan, 1984).

The Smith-Hughes Act of 1917 was the first legislative initiative that promoted vocational education and cooperation between the states in preparing teachers for vocational subjects, established the Federal Board of Vocational

Education, appropriated \$7.2 million annually, and regulated its expenditure. The education offered was for anyone over the age of 14 who was preparing to enter specific fields that required less than college level work (U.S. Congress, 1917). Although this legislation did not specifically provide funding for education-private sector partnerships, the result was closer collaboration between education and the private sector to provide a more highly skilled workforce. Several other acts, such as the George-Reed Act of 1929, the George-Dean Act of 1936, and the George-Barden Act of 1946 also provided funding on a continuing basis to promote training and work experience programs for out-of-school youth and to provide equipment for vocational instruction.

More recently, the Educational Partnership Act of 1988 was enacted to stimulate the creation of partnerships between educational institutions and other organizations, including the private sector. The purpose of the Educational Partnerships Act was to stimulate the creation of educational partnerships to demonstrate their contribution to educational reform. From 1989 to 1994 the Office of Educational Research and Improvement (OERI) provided funding to 30 educational partnerships that had a variety of educational improvement goals. OERI funded Southwest Regional Educational Laboratory and the Institute for Educational Leadership (IEL) to document and evaluate the Educational Partnership Program. Evaluation of this Education Partnership Program indicated successful partnerships are characterized by: 1) an exchange of ideas, knowledge, and resources; 2) partners form mutually rewarding relationships based on

acceptance of compatible goals and strategies; and 3) a respect for partner differences in culture and styles (Tushnet, 1993). Danzberger and deUriarte (1996) indicate evaluation of partnership practices in organizations establishing systemic change reveals the following problems and successes typical of educational partnerships:

- 1) Outside funding stimulates action.
- 2) Each participating organization is challenged to change policies and procedures to accommodate a new way of working with each other.
- 3) Partnership approaches require adaptation to fit each community, school district, and school.
- 4) Organizational mavericks may be a source of creative and meaningful programs, but they need support to strengthen and improve the program.
- 5) A shared vision and deep commitment among partners can overcome weaknesses in program design and implementation.
- 6) Even with confusion about how the partnership structure relates to the program, the partnership itself can be institutionalized.
- 7) Leadership is critical in a complex environment.
- 8) Leaders who reflect commitment to particular programs and processes may be more successful than leaders who see themselves as facilitators.
- 9) Identifying and solving problems, and using adaptive planning contributes to success.
- 10) Skilled and committed staff empowered to carry out partnership plans are an important element in project success.
- 11) A complex partnership can be strengthened by breaking it down into components.
- 12) University students are a valuable resource for classroom teachers.
- 13) Highly stressed, large urban school districts pose extreme challenges to university-based partnerships.
- 14) When partnerships do not receive feedback regularly, their importance may dwindle.
- 15) Educational partnerships can be used to leverage additional funding for activities deemed important by the community.
- 16) Educational partnerships can be used to garner support for school reform in a community. (p. 4)

deUriarte (1994) indicates that the partnerships were established from some set of the following: businesses, colleges and universities, community groups, government agencies, hospitals, law enforcement agencies, religious organizations, and social services. These partnerships were intended to foster projects through which private and nonprofit community organizations and educational institutions would jointly: 1) raise career awareness of secondary and postsecondary students to the world of work, 2) expand learning and experiential learning opportunities for educationally disadvantaged as well as gifted students, and 3) influence improvement in schools.

The Carl Perkins Acts of the 1990s promoted the improvement of secondary and postsecondary vocational education programs by promoting "Tech Prep" programs which linked high school and college level work, promoted greater linkages between education and the world of work, and provided funding for equipment, faculty professional development, and the development of state-of-the-art curricula (U.S. Congress, 1991). Again, the result was increased participation in vocational education programs by students, and closer collaboration between education and the private sector to produce a more highly skilled workforce.

The School-to-Work Opportunities Act (STWOA) of 1994 also resulted in a number of reports highlighting the shortcomings of U.S. schools, particularly in workforce preparation. The purpose of the Act was to: "Provide states with federal assistance for developing state wide systems to ensure K-12 students a seamless

transition from secondary education to high-quality employment or further education” (Northwest Regional Educational Laboratory, 1998).

Although STWOA ended in 2001, funds allocated under that legislation helped establish programs that have three core elements: 1) school-based learning, 2) work-based learning, and 3) connecting activities. Specifically, STWOA required the “integration of occupational and academic curricula, the linking of school with structured work experience, and the creation of formal connections between secondary and postsecondary education” (Stern et al., 1994, p. vii). Many of those work-based activities and connecting activities are facilitated through education-private sector partnerships.

Although STW activities continue to grow, awareness and teacher preparation for STW has not. In a 1998 study, Keller and Owens from Northwest Regional Laboratories administered a study to 185 colleges of education. They found that there was limited awareness, understanding, and acceptance of STW among institutions of higher learning. Those institutions indicated their graduates were well prepared to provide school based learning activities but were not well prepared to facilitate work based learning activities for students. Additionally, those institutions indicated there were no plans to expand or emphasize STW in their teacher preparation programs (Northwest Regional Educational Laboratory, 1998).

The Workforce Investment Act (WIA) of 1998 reformed Federal employment, adult education, and vocational rehabilitation programs to create an

integrated, “one-stop” system of workforce investment and education activities for adults and youth. Entities that carry out postsecondary vocational and technical education activities assisted under the Perkins Vocational and Technical Education Act are mandatory partners in this one-stop delivery system. Training conducted under the WIA requires partnering with employers for placement of trained workers.

The Goals 2000: Educate America Act (U.S. Congress, 1994) recommended educational reform initiatives at all levels and specifically tied funding to the reform initiatives it funded. The Act promoted programs that provided students with pathways to the workforce and encouraged business to enter into partnerships with schools (Moore & Waldman, 1994).

On January 8, 2002, the No Child Left Behind (NCLB) Act of 2001 was signed into law. The purpose of this law is to implement educational reform initiatives that develop an accountable education system. The four major tenants of this legislation are: 1) stronger accountability measures, which include requiring academic standards for reading, mathematics, and science with testing intervals spanning grades 3-5, 6-9, and 10-11—within twelve years all students must perform at proficient levels; 2) increased flexibility and local control, allowing states more freedom to direct federal education monies and reducing the bureaucracy required to acquire and use federal educational funds; 3) expanded options for parents by permitting them to transfer their child from a school identified in need of improvement to a better performing public or charter school

and allowing federal monies for supplemental education such as tutoring, after school services or summer school; and 4) and emphasis [and increased funding] on teaching methods that are proven to work. The implication of this act is more accountability, more freedom of choice for parents, reduction of bureaucracy for acquiring and spending federal education monies, and increased teacher preparation and certification requirements. NCLB does not seem to encourage education-private sector partnerships nor encourage the relationship between the world of work and education (U.S. Department of Education, 2002).

Although the majority of federal legislation did not allocate direct funding for partnerships, the economic incentives had a substantial influence on partner behaviors. The primary goal of developing a better prepared workforce and funding initiatives that delivered on that promise promotes closer collaboration between education and the private sector. As a criterion for preparing successful future employees, those entities that carry out postsecondary vocational and technical education activities assisted under the Perkins Vocational and Technical Education Act and the Workforce Investment Act continue to design more effective pathways for students and unemployed adults, which results in more concrete linkages between education and the private sector. Education-private sector partnerships in recent years have become increasingly more prevalent, particularly with educational reform agendas in mind.

National Studies and Reports

Over the past two decades several national studies have articulated broad-based support for educational reform: A Nation at Risk (National Commission on Excellence in Education, 1983); America's Choice: High Skills for Low Wages (Commission on Skills of the American Workforce, 1990); and Secretary's Commission on Achieving Necessary Skills 1991, 2000. The theme of these studies is that the current educational system has not produced a workforce with requisite entry level skills. These studies advocate for solutions that include: 1) better preparation for the workforce, 2) industry-education partnerships, and 3) development of programs that improve the school-to-work transition for America's youth (Rezin, 1998).

Most recently, the Business-Higher Education Forum (2001), a partnership of the American Council on Education and the National Alliance of Business, have called for increased coordination between K-12, higher education, and the private-sector to boost student achievement, increase partnership accountability, and increase higher education involvement in K-16 issues. The Business-Higher Education Forum goes on to suggest that these tripartite partnerships produce four powerful benefits: 1) generating a comprehensive coherent strategy, 2) achieving critical mass, 3) avoiding "projectitis," and 4) dealing with "it's not my job" (2001).

The Business-Higher Education Forum (2001) reported that major ongoing activism managed by the National Alliance of Business includes the work of the

Business Coalition for Education Reform (BCER), a group of 13 national business organizations, operating more than 600 coalitions promoting greater business activity in education at federal, state, and local levels. Another national organization involved in educational reform is The New American Schools, a private, nonpartisan corporation creating a network of 1,500 schools implementing whole-school reform designs focused on improving student achievement.

The American Association of Community Colleges (AACC) recently held a summit on leadership and workforce development, and in part also concluded that:

Community colleges must begin to assume the role of convener of central shareholders wishing to participate in solving national, state, and local workforce issues and the AACC and community colleges should create tri-partite arrangements with business, government, and education and leverage the best financial models for workforce development. (Elsner, 2001, p. 23)

Education-Private Sector Partnerships

Education-private sector partnerships were initially developed to create public relations opportunities for the private sector, obtain needed resources for ailing schools, and increase opportunities and incentives for faculty professional development and student achievement (Clark, 1991). In the late 1970s, at about the same time as the explosion in community college development in the U.S., the notion of educational institutions partnering with the private sector also became popular.

While the incidence of education-private sector partnerships has increased, not everyone has embraced these partnerships. Faculty in particular have been skeptical about the influence and motivations of the private sector. The increased reliance by many educational institutions on external private support raises philosophical and ethical concerns. In Canada, where education-private sector partnerships proliferate at a rate equal to their U.S. counterparts, teachers in British Columbia have developed ethical standards for partnerships. These standards echo their convictions that partnerships should enhance the quality and relevance of education, but should not exploit the school or students. Partnerships should allocate resources to complement, not replace, public funding of schools, and be evaluated on performance to make informed decisions about continuation of the partnership (British Columbia Teachers Federation, 1996; Froese-Germain & Moll, 2001).

A primary concern of educators is the potential for education private-sector relationships to focus on commercialism rather than mutually beneficial outcomes for students. Nancy Willard, Director for the Center for the Advanced Technology in Education, acknowledges the generosity of “enlightened companies” participating in the educational development of youth; however, she warns: “Businesses all too frequently use their access to peddle products and services and collect personal information for marketing purposes” (Larson, 2001, p. 2).

In her article for the American Council on Education, *Best Practices: Developing Higher Education and Business/Industry Partnerships*, Gonzales

(2000) articulates other concerns about education-private sector partnerships. Not only is the mission focus different between nonprofit and for profit organizations, differences exist between academic and corporate cultures, organizational structures ranging from traditional hierarchy to learning organizations, and philosophies. Additionally, cultural differences such as motivations, methodology, workflow, decision-making processes, and conflicting policies add to the difficulty and concern in making education-private sector partnerships work effectively (Gonzales, 2000).

In response to these types of concerns, the National Association of State Boards of Education, National Parent Teacher Association, American Association of School Administrators, National Council of Social Studies, and the National Education Association have adopted a comprehensive set of guidelines and indicate that:

When working together, schools and businesses must ensure that educational values are not distorted in the process and that positive school-business relationships should be ethical and structured in accordance with all eight adopted principles. (Larson, 2001)

Those principles include disallowing all commercial and marketing involvement aimed at students and the requirement for mutually beneficial educational outcomes.

The number of schools participating in public-private sector partnerships has risen dramatically. In 1983 it was estimated that 17% of public schools were

involved with a private sector partner. By 1990 more than half (51%) of all school districts in the United States had entered into public-private partnerships, involving about 2.6 million volunteers and 65% of all students attended schools in districts that had partnerships with business (David, 1992).

Education-Private Sector Partnership Characteristics

Education-private sector partnerships are generally unique agreements between organizations that resist classification. This section will review characteristics of successful partnerships and steps suggested for establishing partnerships.

Linda Cowan (1994) conducted a thorough examination of these characteristics, which resulted in the development of an education-private sector partnership model used by Tech Prep programs. She suggests that, "...partnerships between business and education are being forged through an appreciation of the mutually beneficial results such partnerships can produce for students, schools, business, the community, and the economy" (p. 35).

Many organizations during the 1990s identified characteristics of successful education-private sector partnerships, including the Office of Educational Research and Improvement, National Dissemination Center for Career and Technical Education, American Council on Education, Institute for Educational Leadership, and Council for Aid to Education (a coalition of urban superintendents). Table 1 summarizes those perspectives about the characteristics of successful partnerships.

Themes emerge from Table 1 suggesting leadership, vision, communication, and mutually beneficial goals are the key components in successful partnerships. However, Table 1 does not provide understanding of the systems, nor nonlinear cause and effect relationships that must also exist in order for dissimilar organizations to create successful partnerships. Table 1 also does not explain underlying motivations, timeliness of actions and decisions, use of feedback loops that influence organizational behavior, and understanding of self-generating, self-organizing, and self-regulating dynamics of those relationships.

Table 1. Summary of Characteristics of Successful Partnerships

American Council on Education:	Acknowledgement of differences Communication Clear and concise goals Flexibility CEO buy-in Third party brokerage of the partnership (Gonzales, 2000)
Office of Educational Research and Improvement:	Appropriate leadership <ul style="list-style-type: none"> • Distributed • Facilitating • Visionary Resources are used to support <ul style="list-style-type: none"> • Time • Training • Matching people • Technical support (Tushnet, 1993)

Table 1. Continued.

Institute for Educational Leadership:	Exchange of ideas Exchange of knowledge Exchange of resources (deUriarte, 1996)
Council for Aid to Education:	Educator support for system reform Goals defined in terms of excellence and equity Corporate capacity for involvement identified Mutual trust (Rigden, 1991)
Urban superintendents' Perspective:	Shared vision, written goals and objectives Top level support, commitment, and visibility Willingness to cross traditional boundaries Formal organizational structure (Clark, 1991)
School-university partnerships:	External demands for change Shared vision and mutual goals Top-level commitment Trusting, respectful relationships Sufficient time Adequate institutional financial support Mutually benefits (Christensen et al., 1996)
National Dissemination Center for Career and Technical Education:	Planning and development Implementation and management Monitoring and evaluation Planning for the future (Imel, 2001)
Western Washington University:	Awareness Coordination Recruiting Planning Motivation Commitment Retention Recognition Evaluation (Cowan, 1994)

Table 1. Continued.

Office of Educational Research and Improvement:	Top-level leadership involvement Grounded in community needs Effective public relations Clear roles and responsibilities Racial-ethnic involvement Strategic planning Effective management and staffing structure Shared decision-making and interagency ownership Shared credit and recognition Appropriate, well timed resources Technical assistance Formal agreements Action and frequent success Patience, vigilance, and increased involvement Local ownership (Grobe, 1993)
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Partnership Developmental Strategies

Many techniques and a variety of steps have been suggested that form a process for establishing effective education-private sector partnerships based on case studies and observations of successful models. Table 2 summarizes some of the more prominent examples of developmental strategies. Although the steps and scope may differ depending on the perspective of the author, common themes emerge. These themes include identifying common needs, defining goals and objectives, clarifying roles, creating upper level buy-in, communicating, working with more than one partner, and evaluating.

These examples provide a simple, cookbook approach for developing education-private sector partnerships, but fail to recognize their complex nature, cultural differences, and timing in the development of these relationships. Further, these examples do not address the systems at work nor the subtle interconnectedness that may contribute to partnership development. A systems theory approach would provide a broader perspective of the interactive elements and how an action in one part of a system may produce leverage to affect another part of the system that, on the surface, may have appeared to be disconnected.

Table 2. Comparison of Partnership Development Strategies

Iowa Council on Vocational Education:	<hr/> Define the need Gain upper level commitment from your organization Clarify what you want and what you can contribute Explore various partner options Choose your prospective partner based on needs Agree to work together Assemble a planning team (State of Iowa, 1995) Define purpose, direction, and accountability Develop joint activities Evaluate the partnership Maintain the partnership (Casey & O'Leary, 1998)
Partnership for Family Involvement in Education:	<hr/> Identify issues to address and reform goals Define purpose and scope of partnerships Identify available resources Connect partnership resources to improvement Measure progress and results Share success stories (Partnerships for Family Involvement in Education, 1997) <hr/>

Table 2. Continued.

Council for Aid to Education:	Agree on specific goals Develop strategies for involvement Identify costs in resources and personnel Monitor, assess and evaluate outcomes Manage the partnership (Rigden, 1991)
Office of Educational Research and Improvement:	Address real problems Select appropriate form of partnership Build on conversations Communicate with all participants Implement Leadership Provide resources Evaluate and adapt Acknowledge and confront problems (Tushnet, 1993)
Institute for Educational Leadership:	Conduct a needs assessment Staff the project Initiating activities <ul style="list-style-type: none"> • Recruitment • Training (deUriarte, 1996)
National Dissemination Center for Career and Technical Education:	Develop partnerships based on mutual needs Work with multiple partners Involve all stakeholders Be sensitive to business culture (Imel, 2001)
Center on Work and Family:	Create a corporate environment that supports educational involvement Assess your company's involvement in business-education partnerships Link to business and school objectives Build coalitions Plan, implement, and evaluate (Casey & O'Leary, 1998)

The literature on characteristics of partnerships and partnership development strategies provides several perspectives and common themes about what elements contribute to successful partnerships. This is a static view and does not address the “why and how” of the relationships. In other words, why did partners come together; why did partnerships develop when they did; how do elements of the developmental systems encourage sustained progress; and how do educational and private sector systems interact and contribute to the development of this project. This study will attempt to answer those why and how questions by describing the experiences of participants in the development process of the CAL using a systems theory paradigm.

Trends in Education-Private Sector Partnerships

National Education Partnership Trends

Education-private sector partnerships are established for a variety of reasons—workforce development, financial benefits, sharing experts, political gain, and prestige, to name a few (Gonzales, 2000). Over time these partnership trends have evolved from one-to-one resource driven initiatives to partnerships addressing concerns regarding the future of our workforce and the viability of our state’s educational systems—with primary focus on educational reform initiatives.

In a survey of executives of employer associations, over 75% of those responding believed the K-12 systems were not doing a good job, and the majority indicated that schools have not improved in the past 10 years (Imel, 2001).

Because of this perception, a new emphasis has been placed on the development of education-private sector partnerships that better prepare workers for employment. Effective partnerships no longer focus on short-term activities or the donation of resources. Rather, the private sector has become increasingly involved in educational reform initiatives (Otterbourg, 1998). "The new partnerships are about strategic workforce development issues and how you leverage time, content and resources..." (Imel, 2001, p. 1).

A recent report from the Business-Higher Education Forum calls on higher education, business, and K-12 leaders to work collaboratively to develop partnerships that will have widespread and long-term effects on improving the nations' schools (Hammock, 2001). In another major initiative aimed at educational reform, the Business Coalition for Education Reform has joined the National Alliance of Business and the American Productivity and Quality Center to lead a national campaign to accelerate state educational reform initiatives. This effort will incorporate the National Baldrige Quality Award criteria for performance excellence to improve student and system performance. This initiative also calls for education-private sector partnerships at the national, state and community levels to align reform initiatives using the Baldrige award criteria and to provide valuable resources to expand, reinforce and accelerate initiatives to raise performance. Richard W. Vague, Chairman of First USA Bank summarizes, "We view education reform... as a marathon, not a sprint" (Business Coalition for Educational Reform, 2001, p. 1).

To the extent that education private-sector partnerships are becoming increasingly involved in educational reform and to provide focus and direction, educational agencies are taking a more proactive stance in dealing with partnerships. For example, the U.S. Department of Education has established an Office of Corporate Liaison whose mission is “to involve the business community in the Department’s mission of ensuring equal access to education and promoting educational excellence for all children” (U.S. Department of Education, 2001, p. 1). The Corporate Liaison Office, among other things, works to “build mutual understanding of the needs of both the corporate world and local communities, and to promote partnerships around the country” (U.S. Department of Education, 2001, p. 1).

Lashway (1999) indicates there are three recent eras in educational reform: 1) the intensification era (1980-1987), which focused on top-down governmental efforts; 2) the restructuring era (1988-1995), which shifted decentralization, professional empowerment, and consumer choice; and 3) the reformation era (1996-current), focusing on accountability, standards, and privatization. Critics of piecemeal education reform attempts have advocated for more sweeping systemic changes. Lashway goes on to state:

Anyone engaged in school reform quickly learns that everything is connected. Similar to the interconnectedness that exists at an environmental level, where an alteration in one link in the food chain has implications throughout the chain, the ripples of school change are often far-reaching as well.... Increasingly, school critics have called for systemic reform—changing the whole system simultaneously. (p. 2)

During the past decade there have been four national systemic educational reform strategies designed to improve student performance: 1) standards-based accountability, establishing performance outcomes and systematic testing; 2) whole-school reform, comprehensive school-wide reform; 3) market strategies allowing for parental choice through vouchers and the establishment of charter schools; and 4) shared decision-making focusing on empowering teachers and administrators. These initiatives have also resulted in reshaping education-private sector partnerships by encouraging collaboration with the private sector and providing additional stimuli for educational institutions to look beyond their walls.

In a paper presented to the Association for Career and Technical Education in December, 2001, Copa and Wolff suggested that education should utilize systems thinking when seeking resources from partnerships. They indicated that organizations should create and implement a systems approach to building solid cooperative relationships with the private sector, other educational institutions, and governmental agencies where mutual gains and costs can be shared or shifted. Further, they indicated that staffing strategies can be addressed with partnerships between other educational institutions and the private sector. Partnership features should include: 1) enhancing student learning, 2) working through partnerships as a regular method of doing business, 3) collaborative relationships and reciprocity in partnerships, 4) tangible agreement to be fully engaged in working, and 5) agreement to continuously evaluate and rethink innovation (Copa & Wolff, 2001).

Northwest Education Partnerships

Many corporations purposefully define their educational partnering strategies to provide focus for potential partners and an economy of scale for themselves. Several of the CAL partners, including LSI Logic, Intel, and Boeing, have published partnership strategies that relate to developing a better-prepared workforce.

The goals for Boeing Education Relations are: 1) support education programs in the communities where its employees live and work, 2) expose students and educators to the operations of a business, and 3) provide opportunity for them to learn how mathematics, science, language, and the arts are applied in the workplace. Boeing has placed significant emphasis on partnerships with business and engineering programs. At the high school and community and technical college levels Boeing contributes resources for tech-prep programs designed to develop an interest in the machine tool technology field and provide student scholarships, grant funding up to \$15,000, and access to surplus equipment and supplies. Boeing also participates in educational reform initiatives such as Achieve, Inc. and New American Schools (Boeing, 2001a, 2001b).

Intel, a major microelectronics manufacturing corporation, assists educational institutions that fit into their workforce development strategies with resources. The corporate strategy for workforce development includes: 1) a seamless K12-community college-university pipeline, 2) working within the Community College Charter, 3) working in collaboration with other Industries, 4)

pursuing leveraged federal and state resources, 5) pooling resources and talents of strategic colleges, and 6) strategically infusing Intel resources. Assistance from Intel is dependent on educational institutions attaining specific curriculum objectives. Partnering with educational institutions is predicated on attainment of curriculum standards that meet the needs of Intel. Level of attainment determines the level of partnering and resources provided, such as support for educational laboratories (Intel, 2000).

LSI Logic, another Pacific Northwest microelectronics manufacturing firm, has developed links to local community colleges and has agreed to partner with the CAL project. Their participation in CAL and with educational institutions includes curriculum development activities, internship opportunities for students, resources for educational institutions, and linkages and financial incentives for their employees to participate in degree and upgrade programs (LSI Logic, 2001).

Other examples of Pacific Northwest education-private sector partnerships include the Oregon Building Congress, which is the educational arm of the Associated General Contractors, and 22 influential companies and governmental agencies. Their goals are: 1) to bring better quality and more diverse applicants into the construction industry, 2) to partner with educators so they can learn about the construction industry, 3) to develop specific programs for students, and 4) to educate parents and students about the construction industry. The Oregon Building Congress has partnered with many educational institutions and skill centers to

provide educational opportunities for young students (Oregon Building Congress, 2001).

Several Pacific Northwest nonprofit organizations have been established to promote partnerships between educational institutions and the private sector to encourage mutually beneficial outcomes and educational reform. Those organizations include:

- Science Education Partnerships (SEPS) whose goals are: 1) to use community scientists to help teachers provide a quality science education for all students; 2) maintain a database of scientists who are eager to give presentations, arrange field trips, mentor individual students, and help teachers with classroom science activities. Partners include Oregon State University, Hewlett-Packard, and Corvallis School District Partners (Corvallis School District, Oregon State University & Hewlett-Packard, 2000).
- The Washington Biotechnology Foundation (WBF), whose goal is to bring together organizations, companies, academic institutions and individuals to foster education and partnerships in the field of biotechnology (Washington Biotechnology Foundation, 2000).
- Teaching Scholar Partnerships (TSP), whose goals are: 1) to encourage undergraduate students in science, mathematics, engineering, and technology (SMET) to consider K-12 math and science teaching as a career option; 2) to enrich and strengthen the learning experience of K-

12 students in mathematics and science by funding the placement of college undergraduates in science, mathematics, engineering, and technology (SMET) in K-12 classrooms; and 3) to generate national attention on the critical contributions that collaborative K-16 partnerships make to ensure the vitality of local schools. Partners include the American Association of Community Colleges (AACC), the Council for Independent Colleges (CIC), the Independent Colleges Office (ICO), and the National Science Foundation (NSF) (Felise, 2000).

- Worksite 21, whose goals are: 1) to provide consulting assistance, communication materials, networking opportunities, and training services to help employers create meaningful learning opportunities for students and teachers, and 2) to contribute to Oregon's long-term social and economic well being. Worksite 21 was launched as a new program of the Oregon Business Council (OBC). The Oregon Business Council is a nonprofit, nonpartisan and independent organization of over 40 top Oregon business leaders. OBC's mission is to ensure that Oregon's K-12 education transformation is part of the state's vision for a seamless training system to support lifelong learning (Worksite 21, 2000).
- Partnership for Learning, an independent, nonprofit organization supported by Washington business and community leaders, whose goals are: 1) to increase public awareness and understanding about

Washington's efforts to improve the quality of education for all its students, 2) to provide in-depth but easy-to-understand information about the state's school improvement effort, 3) communicate with teachers and school communities about the state standards and tests and provide research-based information on how schools can organize to help all students meet the state standards, 4) to provide high quality informational materials, and 5) to support local school improvement efforts. Partners include education leaders in nine communities, including Bellingham, Everett, Olympia, Spokane, Tacoma, the Tri-Cities, Vancouver, Wenatchee, and Yakima. The Partnership is supported by 60 businesses and community foundations committed to improving public schools in Washington State (Partnership for Learning, 2000).

- Pierce County (Washington State) Careers Consortium, a highly successful partnership in the greater Tacoma region, is a multi-service intermediary organization that convenes and facilitates collaboration with key business, labor and education sectors. The purpose of these collaborations is to develop and deliver high demand education and training which results in a skilled regional workforce. The vision for the organization is a community of learners where all are equipped to successfully transition between education and work, leading to career success and a value for lifelong learning. The partnership includes five

community and technical colleges, fifteen school districts, three chambers of commerce, workforce development boards and councils, and numerous private sector entities. The Consortium has been extremely successful in developing industry skill standards, coordinating articulation and dual credit programs, coordinating internship opportunities, and implementing career pathways programs (Pletcher, 2002).

Increasingly, education-private sector partnerships are proliferating both at the national level and throughout the Pacific Northwest. In general, these partnerships reflect the collective educational and private sector priorities for the region. Those priorities include excellence in education and regional workforce development needs organized around industry clusters. Strong existing Pacific Northwest industry clusters include manufacturing, construction, information technology and software development, and health care, while biotechnology also is emerging as major industry in this region. The previously described partnerships have all been developed to respond to existing and emerging education and private sector needs. These education-private sector relationships continue to provide the private sector with influence in educational reform initiatives.

Systems Theory

Systems thinking is a holistic world view that suggests an understanding that everything is interconnected. Capra (1996) provides further insight: "A

system has come to mean an integrated whole whose essential properties arise from the relationships between its parts, and systems thinking is the understanding of a phenomenon within the context of a larger whole” (p. 27). Senge et al. (1994) describe systems thinking as “a way of thinking about, and a language for describing and understanding the forces and interrelationships that shape the behavior of systems” (p. 6).

In a larger sense, the Gaia hypothesis first proposed that the earth is comprised of innumerable interconnected smaller systems and embodies all the characteristics of a living system, implying that nothing on this planet stands in isolation or is insulated from the affects of other parts of the system (Capra, 1996). The CAL can be viewed and described as a living system. Organizations like the CAL are not static; they are ever developing, changing, learning from themselves, and adapting to their environment. Understanding the characteristics of a living system provides insight into how organizations operate, or rather, behave, and how they are connected to other larger and smaller systems.

Understanding characteristics and behaviors of living systems provides insight into the dynamics, leverage points, and interconnectedness between system components and tangent systems. Above all, systems thinking provides a contextual framework for understanding nonlinear systems, requiring a level of data synthesis, as opposed to analysis, in which some system properties may be destroyed when dissected into discrete elements. Some of the characteristics of living systems used to study the CAL include:

- Living systems develop recognizable patterns of behavior, organization, and relationships. Gaining a better understanding of the nonlinear nature of systems and the indirect cause and effect variables that influence systems results from recognizing these patterns.
- Systems are imbedded, adjacent, or connected to other systems. No system stands alone in isolation from influences of other systems. This characteristic permits the ability to shift one's attention back and forth between system levels.
- Systems are examined with approximate knowledge. Heisenberg (1958) suggests that the act of observing influences the outcome of what is being observed. In this regard the researcher in a qualitative study, by interacting with informants, introducing researcher perspectives, and through fallible interpretation, alters perceived reality about a given situation. He wrote:

...this means that the very act of observation affects and alters the state of what is being observed... what we observe is not nature itself, but nature exposed to our method of questioning. In other words, our lenses help shape our view of reality. Ultimately, this means that the very act of looking determines what we see and that objectivity is an illusion. (p. 163)
- Systems are self-regulating by maintaining a dynamic balance among tolerable/allowable limits within themselves. Feedback loops provide the regulatory inputs, which are actually outputs of other elements within the system.

- Systems are self-organizing (autopoiesis). Each component of a system contributes to the generation of elements that further define the system. In other words, the product of a system operation is its own organization. Although systems may appear to operate in random or chaotic fashion it is the spontaneous emergence of order that becomes self-organizing. A constant flow of energy and matter through a system is required for self-organization. New structures and new forms of behavior emerge when the system is far from equilibrium. For a system to be capable of self-organization it must be nonlinear, connected with feedback loops.
- Feedback loops are the circular arrangement of interconnected components of a system that return a portion of the output back to the input. Feedback serves to increase, decrease or maintain performance in a system or process.
- The structure of a system influences behavior, and the structure in living systems can be subtle. Behavior within a system can be changed if the leverage points can be identified and accessed.
- Applying leverage is a small action, usually at a non-obvious or indirect point, that has the ability to influence large changes within a system. Applying leverage in a system often comes from thinking in new ways or viewing a situation from a different perspective (Capra, 1996; Kiefer & Senge, 1982; Senge, 1990; Senge et al., 1994; Wheatley, 1999).

An organization that believes it can shape its own destiny through a fundamental shift of mind is considered a metanoic organization (Kiefer & Senge, 1982). In a general sense the term is used to describe a unifying principle underlying a broad base of contemporary organizational innovations. This principle suggests that individuals aligned with an appropriate vision can have extraordinary influences on their environment. Metanoic organizations possess five primary dimensions:

- Members of the organization have a deep sense of vision or purposefulness and are striving to create a clear picture of the future based on the shared vision.
- Alignment of personnel around that vision is created through shared values and influences decision-making throughout the organization when everyone is oriented in the same direction.
- Empowering people in an open environment in which individuals are free to learn from action and mistakes creates an empowering organization capable of inherently maintaining momentum.
- Structural integrity focuses on whether an organizational design is consistent with its purpose in the areas of roles, accountability, key policies and information flow.
- A balance of reason and intuition in the desire for continuous improvement complements rational analysis and planning in

understanding the internal dynamics as well as its interactions within its environment (Kiefer & Senge, 1982; Senge, 1990).

To summarize, alignment in a metanoic organization develops from the intuitive interconnectedness of people and allows each to act spontaneously in the best interest of the whole. "Highly aligned groups perform complex tasks in ways that cannot be planned rationally" (Kiefer & Senge, 1982, p. 4).

As part of a living system, CAL is also potentially a metanoic organization. This means that development of the CAL could be influenced continuously by its environment while simultaneously, through learning, create fundamental cognitive shifts in individuals towards alignment with the appropriate vision. Within this system structure, chance, choice and certainty continually modify function, purpose, and relationships. In that regard, use of systems theory to develop a framework to study the CAL is appropriate and lends itself to identification of underlying patterns and trends, and understanding and describing the interaction of these systems within systems.

The life cycle of a project defines a beginning, the processes or phases of a project, and an ending. The development of the Center for Advanced Learning can be described as the first phase in the life cycle of that organization while the opening of its doors can be viewed as the second or implementation phase. Systems theory will be used to describe the experiences of those participating in the project, processes, key components, leverage points, and interrelationships.

Summary

Chapter 2 is a review of literature pertinent to this study. The literature reviews knowledge pertaining to: 1) education legislation, 2) education reform, 3) education-private sector partnership practices, and 4) systems theory. The chapter presents these topics in the context of: 1) education-private sector partner historical perspectives, which includes federal legislation, national studies and education private sector partnerships; 2) characteristics of education-private sector partnerships and strategies for developing those partnerships; 3) systems theory; and 4) trends in education-private sector partnerships, both at the national level and in the Pacific Northwest.

Chapter 1 discusses the increasing pressures from educational stakeholders influencing educational reform initiatives, particularly at the secondary level. This has led to federal and state legislation along with national studies suggesting the importance of providing contextualized education that links that education to the world of work and higher education articulation opportunities. From a systems perspective, the State of Oregon has implemented charter school legislation and mandated the Certificates of Initial and Advanced Mastery be implemented to provide both accountable measures of student success and career pathway opportunities.

The literature presents general characteristics of successful education-private sector partnerships that include: 1) shared vision, 2) mutually beneficial goals, 3) organizational top-level involvement, and 4) formal agreements, to name a

few. These characteristics, along with a variety of strategies for developing partnerships, include the following reoccurring themes: 1) define the need, 2) assemble a planning team, 3) agree on the goals, 4) build coalitions, and 5) evaluate the project. These themes do not adequately describe the systems dynamics involved in developing education-private sector partnerships. This study examines development of the Center for Advanced Learning, a collaborative educational reform project, founded on the premise that education-private sector partnerships are important in providing contextualized educational opportunities that are linked to the world of work and higher education while addressing regional workforce development needs. This study describes development of the Center of Advanced Learning from a systems theory perspective.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to investigate the Center for Advanced Learning developmental process and gain an understanding of the factors contributing to education-private sector partnerships that evolved from the CAL experience. The study examines how a conversation between three individuals, concerned about the preparedness of high school students for the world of work or higher education, developed into a regional educational project. This case study examined the experiences of participants during the development phase of the project as well as documents and observations of meetings. The project was examined using systems theory, educational reform, and education private sector partnerships as context for the framework. Relationships, if any, between private sector motivations, management practices, systems interactions, and the life-cycle process that encourage sustained progress were investigated. While unique, this project epitomizes the new generation of education-private sector partnerships that support educational reform initiatives. The findings from this study may be applicable to other, similar projects.

A case study research methodology was used to address the following research questions:

1. Why did representatives from the private sector choose to partner with the CAL? The motivations and expectations that affected development of these relationships were examined.
2. Why did some potential partners choose not to partner with the CAL? The motivations of private sector representatives of potential partners that choose not to partner with the CAL along with possible contributing conditions were examined.
3. What are the systems components that contributed to developing this collaborative educational reform project? A timeline outlining the three years of CAL development were examined, development processes documented, and key decision points were identified.
4. How do elements of the developmental systems encourage sustained progress? It was anticipated that key components within developmental systems would be identified which encouraged sustained developmental progress.
5. How do educational and private sector systems interact and contribute to development of this project?

Case studies "...are the preferred strategy when 'how' or 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (Yin, 1987, p. 13). Yin further defines a case study as an empirical inquiry that investigates when the boundaries between phenomenon and context are not clearly evident and

in which multiple sources of evidence are used. Creswell (1994) indicates that case studies explore a single entity or phenomenon bounded by time and activity. Each case study is unique in the nature of that case, including its historical background, economic, ethical, aesthetic, and physical settings (Stake, 1994). These elements together create context for describing the phenomenon. The case becomes known through participant experiences articulated during interviews and through analysis of artifacts, which in this case will be documents created during the development of CAL.

Because of the uniqueness of the CAL and its ongoing dynamic nature, an instrumental case study will be conducted. One purpose of a case study is to provide insight into a particular issue or phenomenon. Stake (1994) identifies an instrumental case study as one that is undertaken for the sake of understanding a particular phenomenon and providing insight. In this context, understanding the development of the CAL provides insight into development of partnerships and understanding the development of an educational project using a framework of systems theory. This case study was undertaken because of the intrinsic interest in the CAL as a unique project and for insight that may be gained about partnerships and systems theory. This case study was not for the purposes of representing other similar projects or for the development of theory.

Case studies lend themselves to gaining a greater understanding of a bounded system both in time and place, and are ideally suited for describing changing trends. They provide a holistic view through thick descriptions using

multiple sources of data. The findings are typically presented as lessons learned (Lincoln & Guba, 1985). Purposeful rather than random sampling is conducted (Creswell, 1998). Purposeful sampling elicits data from multiple targeted sources identified by the researcher as potentially rich resources.

The trustworthiness of qualitative research is established in order to answer a number of questions relating to truth value, applicability, consistency, and neutrality. Guba (1981) was first to provide this framework to understand the trustworthiness of data used in qualitative research. Data used in this research is qualitative, subjective, and interpretive in nature. The trustworthiness of data used in the study is addressed through the use of a variety of strategies and is described later in this chapter.

Setting for the Study

The CAL is located in Gresham, Oregon, part of the greater Portland metropolitan area. Educational entities that initially partnered to develop and establish the Center for Advanced Learning include three separate high school districts (Gresham-Barlow School District, Centennial School District, and Reynolds School District), a community college (Mt. Hood Community College), the Mt. Hood Community College Regional Education Consortium (MHCCREC), two four-year institutions (Oregon Institute of Technology and Portland State University), and Multnomah Education Service District. All secondary school

districts within MHCC's district, along with MHCC, comprise the MHCC Regional Educational Consortium (MHCCREC).

Gresham-Barlow School District has two participating high schools, Gresham High School and Sam Barlow High School, while Centennial and Reynolds School Districts each have one participating high school. Table 3 provides a summary of initial participating high school demographics.

Table 3. CAL High School Enrollment in Learning Program Areas

	Center for Advanced Learning Participating High Schools			
	Gresham HS	Sam Barlow HS	Centennial HS	Reynolds HS
Total students	1850	1885	1631	2162
Teaching staff	102	106	80	112

Mt. Hood Community College (MHCC), located in Gresham, Oregon, is the fourth largest community college in the state and serves over 30,000 students—the equivalent of 9,500 full-time students, with a full offering of professional technical and transfer programs. The Director of MHCCREC works for MHCC to coordinate collegiate opportunities for school districts that reside within MHCC's district and has been the coordinator of the CAL project for the past three years.

Oregon Institute of Technology (OIT) offers traditional four-year bachelor's degree programs in the engineering and health technologies, applied sciences, management and communications, and is located in Klamath Falls, Oregon. OIT

serves 2,300 students at the Klamath Falls site and 500 students at a branch campus in Portland, Oregon, which services the greater Portland Metro area with Clackamas, Mt. Hood, and Portland Community Colleges. Many Mt. Hood Community College programs transfer directly into OIT programs and OIT currently offers course work towards a Bachelor of Science degree in Industrial Management on the MHCC campus. Other programs with connectivity between the CAL, MHCC, and OIT include manufacturing, mechanical and civil engineering, several health sciences, and information technology related curricula.

Portland State University is located in downtown Portland, Oregon, the largest city in Oregon, with an approximate population of 900,000. Portland State offers over 100 undergraduate, masters, and doctoral degrees, as well as graduate certificates and continuing education programs. PSU serves more students and confers more graduate degrees annually than any other Oregon university.

Ten potential private sector partners were initially invited to participate in the project: Boeing, LSI Logic, Fujitsu, Atlas-CopCo Wagner, Ketiv, Intel, Oregon Building Congress, Leatherman, Legacy Health System, and QPM Aerospace. Not all of these remained with the project, but other potential partners emerged as the project progressed. Table 4 provides a summary of demographics of the initially identified potential partners.

Table 4. Initial CAL Potential Partners

Organization	Type of business	Products	Employees	Revenues
Boeing	Engineering & Manufacturing	Aircraft	186,900	\$58B
LSI Logic	Microelectronics manufacturing	Computer chips	5,500	\$1.8B
Fujitsu	Microelectronics manufacturing	Computer chips	170,000	\$37B
Atlas-CopCo Wagner	Manufacturing	Mining equipment	26,201	\$6.09B
Ketiv	Software Design	Software	1,200	\$936M
Intel	Microelectronics manufacturing	Computer chips	80,000	\$26B
Oregon Building Congress	Construction Trades Education	Educated youth	4	Non-profit
Leatherman	Engineering & manufacturing	Multi purpose knives	450	Privately held
Adventist Health Care	Health care	Hospital services	17,200	\$2.8B
Legacy Health System	Health care	Hospital services	7,000	Non-profit
QPM Aerospace	Manufacturing	Aircraft parts	100	Privately held

The CAL is envisioned to serve as a comprehensive state and, potentially, national model consistent with educational reform initiatives at both the state and national levels. It is to be established as a charter school, offer college credit, and

have links and pathways established with higher education and the world of work. The CAL will deliver three curricula that correspond to three Certificate of Advanced Mastery strands: 1) health sciences, 2) information technology, and 3) pre-engineering and advanced manufacturing. The proposed system would allow students in the 11th and 12th grades to elect into the Center for half of their course work with multiple options for progressing, including continuation at the community college, direct access to four-year institutions, linkage to area apprenticeship programs, and the opportunity to enter the job market and return to school at any point without loss of continuity.

A major goal for the CAL is to develop long-term mutually beneficial partnerships with the private sector that contribute to student success. Anticipated benefits to this educational endeavor would be industry expertise in the classroom, integration of industry-based skill standards and knowledge into the curriculum, internship opportunities for students, exchange opportunities for faculty, and donations of equipment and potential funding of laboratories and instructional media.

The planning process began in 1998 when representatives of MHCC, Boeing, and Oregon Manufacturing Council met to discuss alternative methods of preparing students for the world of work beginning with their secondary educational experience. The planning process for development and implementation of the CAL included creating a regional vision and development of a strategic plan that addressed outcomes, funding, governance, curricula, facility, equipment,

partnerships, staffing, and evaluation issues and needs. Despite early efforts to recruit private sector partners, their participation in the project was intermittent characterized by potential private sector representatives that may have participated for a period of time and then departed. During the first two years of planning no written agreements with permanent partners were established (Buck, 2001a).

During fall 2000, grant funding was received to support curriculum development and charter school application, two districts passed bond measures (in excess of \$6,000,000), state legislation was enacted to provide resources for equipment, and architects began facility planning. In spring 2001 MHCC committed an additional \$2,000,000 to the project and Centennial High School district pledged another \$1,500,000.

Case Study Methodology

The purpose of this section is to explain the case study methodology to be used in this study in context with the research assumptions. The qualitative case study paradigm is based on several assumptions about the nature of reality (ontology), the relationship of the researcher to what is being researched (epistemology) and the process of the research (methodology). The epistemological assumption of qualitative research is that the researcher interacts with that being researched, while the ontological assumption is that reality is subjective and multiple as seen by participants of the study (Creswell, 1994).

This section addresses the following case study components: 1) trustworthiness of data, 2) types of data sources to be collected and the methods used to determine the trustworthiness of the data, 3) methods to be used for data collection, 4) methods to be used to store data, 5) data analysis techniques to be used, and 6) the method of entry into the field of study.

Ensuring the Trustworthiness of the Research

The foundations of qualitative research or naturalistic inquiry “rests on the assumption that there are multiple realities, that inquiry will diverge rather than converge as more and more is known” (Guba, 1981, p. 77). Similarly, Eisner (1991) indicates, “We seek a confluence of evidence that breeds credibility, that allows us to feel confident about our observations, interpretations, and conclusions” (p. 110). The implication is that the researcher is not an objective observer but influences the informants and research because of the interaction between the researcher and the environment in which the study takes place. This interaction introduces researcher perspective into the study and influences the interpretation of the data.

In quantitative research, the rationalistic paradigm rests on the assumption that generalizations are possible by focusing on similarities between the objects of research, while qualitative research often focuses on differences between objects as frequently as the similarities. Guba (1981) recognized these differences while addressing the differences in criteria for assessing the trustworthiness of research.

Qualitative researchers use internal validity, external validity, reliability and objectivity for assessing the trustworthiness of their work. He described truth value, applicability, consistency, and neutrality as similar concepts applicable to both qualitative and quantitative research. More specifically, Guba (1981) and Lincoln and Guba (1985) described four criteria specifically applicable to establishing the trustworthiness and rigor of qualitative research: 1) credibility; 2) transferability; 3) dependability; 4) and confirmability.

Credibility means representing the experiences of study participants as accurately as possible by describing adequately the researcher's interpretation of text and of the multiple realities presented by research participants to the extent that if those participants were presented with the research descriptions of their experiences, they would recognize them. The emphasis of establishing credibility is on identifying reoccurring themes and patterns. Strategies for establishing credibility are: 1) prolonged and varied field experience, 2) maintaining field journals (reflexivity), 3) triangulation of data, 4) member checking, 5) peer examination, 6) interview techniques, 7) establishing the authority of the researcher, and 8) structural coherence (Creswell, 1998; Guba, 1981; Krefting, 1999; Lincoln & Guba, 1985).

Transferability is the degree to which findings can be applied to other settings and is not viewed as important to qualitative research because the purpose of qualitative research is to describe a phenomenon rather than to generalize to other situations. However, Creswell (1998) indicates that to make sure findings are

transferable between the researcher and those being studied, thick description are necessary. Additionally, comparison of samples to demographic data, and time sampling can contribute to establishing transferability (Krefting, 1999).

Dependability is the degree of consistency that research findings are based on stable data. Variability of human experience is expected in working with human subjects but the key is to learn from informants rather than to control them (Krefting, 1991). While individual experiences may not be averaged, and single experiences may establish atypical boundaries for the research, all voices are considered important. Guba (1981) suggests that while variability is expected, dependability implies acknowledging variability and tracking it to identifiable sources. Strategies for ensuring dependability include: 1) dense descriptions, 2) triangulation of data, 3) sampling to the point of redundancy, 4) dependability audits, 5) peer examination, and 6) code-recode procedures (Creswell, 1998; Guba, 1981; Krefting, 1999; Lincoln & Guba, 1985; Patton, 1990).

Confirmability is the degree to which biases, motivations, and perspectives are acknowledged and considered. Confirmability in qualitative research is viewed as objectivity and is achieved through the rigor of the methodology and the distance between the researcher and subjects. While the goal of qualitative research is to consider many voices, one objective is to reduce the distance between researcher and informants. Lincoln and Guba (1985) indicated the objectivity (neutrality) of the data should be of importance rather than the objectivity (neutrality) of the researcher. They further suggested the confirmability is

established when credibility (truth value) and transferability (applicability) are established. Strategies for establishing confirmability are: 1) confirmability audit, 2) triangulation of data, and 3) maintaining field journals (reflexivity) (Creswell 1998; Krefting 1999).

An important question the qualitative researcher must be prepared to answer is: "How do we know that the qualitative study is believable, accurate, and 'right'?" (Creswell, 1998, p. 193). Creswell (1998) suggests the issue is verification of trustworthiness and there are eight strategies available to the qualitative researcher for doing so: 1) prolonged engagement and persistent observation to build trust with participants, learning the culture, and checking for misinformation; 2) triangulation using multiple sources of data, methods, and investigators to provide corroborating evidence; 4) peer review or debriefing as an external check of the research process; 3) negative case analysis by refining the working hypothesis as the study progresses; 5) clarifying researcher bias at the onset of the study to provide the reader understanding of the researcher's perspective; 6) member checks in which the researcher asks participants to review written drafts to judge the accuracy of researcher conclusions and interpretations; 7) rich, thick descriptions of participant experiences to enable readers the capability of transferring information to other settings because of shared characteristics between the phenomenon described by the researcher and other similar situations, often in the form of lessons learned; and 8) external audits,

conducted by an authoritative agent, used to examine the processes and the research product for accuracy.

Creswell (1998) recommends that a minimum of two strategies be used to establish the trustworthiness of research for any one study. This researcher utilized: 1) triangulation of data, 2) member checking, 3) thick descriptions, 4) disclosing researcher experiences and perspectives, 5) prolonged engagement, and 6) establishing an audit trail.

- Triangulation of data is the use of multiple sources of data and methods to provide corroborating evidence (Creswell, 1998; Krefting, 1999; Lincoln & Guba, 1985; Patton, 1990). Three sources of data were collected: 1) seventeen interviews which were transcribed verbatim and coded with five follow up interviews to clarify or gather additional data; 2) four hundred sixty nine documents relating to CAL were collected, cataloged, and coded; and 3) observations of meetings were kept in a field journal and also coded. All cataloged and coded data was stored in an electronic database, which readily facilitated the capability to sort, cross-reference, correlate, and triangulated data. For example, frequently a data search would be made for a given topic, date, person or other subject across all three sources of data. This capability provided the opportunity to triangulate a myriad of data.
- Member checks solicit views of informants regarding the credibility of findings and interpretations to the extent that members will recognize

their experiences in the writings (Creswell, 1998). This researcher prevailed upon seven informants to review portions of the findings, conclusion, and implications to judge the accuracy. In several instances drafts were modified to more accurately reflect the experiences of the participants (informants).

- Thick descriptions provide the reader with the ability to transfer information to other similar situations because of shared characteristics. Although the intent of this research is not to generalize, insight can be gained that may be useful as lessons learned for other similar situations. Additionally, thick description provide context to qualitative research by providing detailed background information and the opportunity to hear many voices. This researcher provided detailed background information about regional demographics, the developmental process, motivations of participants, and included all seventeen interviewees' voices in this study.
- Researcher perspective was presented from the outset of the study in the researcher disclosure statement commenting on past general experiences in education, experiences at Mt. Hood Community College, and experiences related to the CAL curriculum development.
- Prolonged engagement and observation in the field builds trust with participants, informs the researcher about the prevailing culture, and provides opportunity to clarify information through interaction with

participants and observations by the researcher (Creswell, 1998). This researcher participated in a portion of the curriculum development process, attended many meetings while conducting formal observations for the purpose of gathering data for this study, and informally attending meetings prior to this study to become informed about the project.

- Establishing an audit trail means making it possible “for an external auditor to examine the processes whereby data were collected and analyzed, and interpretations were made” (Guba, 1981, p. 87). This researcher created documentation to establish an audit trail in the form of electronic catalogues for: 1) all references, 2) all data collected from interviews, documents, and observations, 3) interviewee transcripts, 4) analysis of interviews, and 5) field notes from observations.

Stake (1995) identified criteria specifically essential to establishing trustworthiness in case studies and indicates that triangulation and member checking are the most important criteria for verifying the trustworthiness of research in a case study. To complement those criteria he developed a critique checklist that provides 20 criteria for assessing quality of a case study. The critique checklist asks the following questions:

- 1) Is the report easy to read?
- 2) Does it fit together, each sentence contributing to the whole?
- 3) Does the report have a conceptual structure?
- 4) Are its issues developed in a serious and scholarly way?
- 5) Is the case adequately defined?
- 6) Is there a sense of story to the presentation?
- 7) Is the reader provided some vicarious experience?

- 8) Have quotations been used effectively?
 - 9) Are headings, figures, artifacts, appendixes, and indexes used effectively?
 - 10) Was it edited well?
 - 11) Has the writer made sound assertions, neither over- nor under-representing?
 - 12) Has adequate attention been paid to various contexts?
 - 13) Were sufficient raw data presented?
 - 14) Were data sources well chosen and in sufficient number?
 - 15) Do observations and interpretations appear to have been triangulated?
 - 16) Is the role and point of view of the researcher nicely apparent?
 - 17) Is the nature of the intended audience apparent?
 - 18) Is empathy shown for all sides?
 - 19) Are personal intentions examined?
 - 20) Does it appear that individuals were put at risk?
- (Stake, 1995, p. 131)

In addition to implementing a variety of strategies for establishing the trustworthiness of the research, this critique checklist was used by the researcher as a guide in developing and conducting this research to establish and assess quality measures for this case study.

Each type of data presents certain advantages and limitations to its usefulness that can impact the trustworthiness of data if those characteristics are not considered. Table 5 (Creswell, 1994, p. 150) provides a summary of the advantages and disadvantage of the three types of data that will be used in this study.

Table 5. Advantages and Disadvantages of Types of Data Used in this Study

Type Data	Advantages	Limitations
Observations	<ul style="list-style-type: none"> –First hand experience –Record information as it occurs –Unusual aspects can be noticed –Useful to explore topics that may be uncomfortable for interviewees 	<ul style="list-style-type: none"> –Researcher may be seen as intrusive – “Confidential” information may be observed –Researcher may not have good observational skills
Interviews	<ul style="list-style-type: none"> –Useful when informants cannot be directly observed –Informants can provide historical information –Allows control over line of questioning 	<ul style="list-style-type: none"> –Provides indirect information –Provides information in designated locations, not natural setting –Researcher presence may bias responses –Not all informants are equally articulate
Documents	<ul style="list-style-type: none"> –Enables researcher to obtain language and words of informants –Can be accessed at a time convenient to the researcher –Represents data that may be thoughtfully compiled –Saves the time and expense of transcribing 	<ul style="list-style-type: none"> –May be protected information –Requires researcher to seek out information in hard-to-find locations –May requires transcribing for computer entry –Material may be incomplete –Documents may not be authentic

Data Sources

Three primary data sources were utilized: interviews, documents, and observations.

Interviews. Interviews were conducted in the general interview guide tradition in which the interviewer used a protocol guide to ensure all relevant topics are covered. The interview guide is a list of questions that are to be explored

during the course of the interview, while the researcher (interviewer) is responsible for adapting the wording and the sequence of questions to the respondents in the context of the interview (Patton, 1990). The guide serves to delimit in advance the issues to be explored and encourages a systematic and comprehensive interviewing methodology.

Interviews were conducted with educators, private-sector and governmental representatives involved in the development of the project to examine motivation, process, and practices. Interviewees consisted of a heterogeneous sample of participants that were purposefully selected to provide a cross section of participants who could best answer the research questions. Included in this group were private sector representatives from three regional industries; education representatives that included faculty and administrators from the high school, community college and university levels; and governmental officials. No attempt was made to randomly select interviewees. Rather, purposeful sampling was conducted with individuals identified as participants in the project. A cross section of educational, private sector, and governmental representatives was chosen. Those individuals participated in CAL development at all levels, positions, and jobs and represented equally diverse demographics in their home organizations as well.

Private sector participants are mid- to senior-level managers who were involved in the decision whether or not to participate in the CAL project, and those who did actively participate. These participants were representatives from three broad regional industries clusters: 1) manufacturing and pre-engineering, 2) health

sciences, and 3) information technology. Some companies represented more than one career pathway to the CAL. The size of the companies varied from those that employed as many as several thousand workers in the Portland Metro area to others with less than 100 employees. Mid- to senior-level managers participated in many of the CAL developmental processes that included facilities planning, curriculum development, equipment and instructional media selection, visioning, and resourcing. Table 6 reflects the career pathways companies represented to the CAL.

Table 6. Career Pathways Companies Represented to the CAL

Organization	Career pathways			
	Pre-engineering	Manufacture	Health care	Information technology
Boeing	X	X		
LSI Logic	X	X		X
Fujitsu		X		
Atlas-CopCo Wagner	X			
Ketiv				X
Intel	X	X		X
Oregon Building Congress		X		
Adventist Health Care			X	
Leatherman	X	X		
Legacy Health System			X	
QPM Aerospace		X		

Six private sector representatives directly involved in the CAL project were interviewed. To obtain a representative sampling of private sector participants, interviewees were selected from three industries representing CAL career pathways

and included individuals who were involved with the project from the beginning as well as individuals who began participation as late as two years into the project.

Some individuals represent more than one category as described below:

- a. One private sector participant from each of the three curricular career pathways (pre-engineering/advanced manufacturing, information technology, and health sciences) was selected from those private sector organizations that chose to affiliate and partner in the CAL project.
- b. One private sector participant from each of the three curricular disciplines (pre-engineering/advanced manufacturing, information technology, and health sciences) were selected from those private sector organizations that chose not to participate or chose to withdraw after initial affiliation.
- c. Two of the three individuals who initiated the conversations about a regional education reform initiative and met to envision development of a CAL type organization were interviewed. Those individuals include a representative of the Oregon Metals Council, and the Director of Educational Affairs for Boeing, Portland.
- d. The chief decision makers for the initial three private sector partners were interviewed. These decision makers are the CEOs or their designated representatives of those companies that initially chose to partner with the CAL.

Nine educators directly involved in the CAL project were initially interviewed. Interviewees were selected from a sampling of secondary, community college, and university faculty and administrators to provide a cross section of educational institutions and roles of individuals within those institutions:

- a. One superintendent and two assistant superintendents representing three school districts were interviewed. The superintendent and assistant superintendents have been involved in the project from its beginning and have been responsible for parts of the design, planning and implementation processes as well as being part of the decision-making team. One superintendent is designated as the Project Manager and has been the focal point for coordination and decision making.
- b. A former superintendent of one of the high school districts who served as the CAL project manager until she recently assumed presidency of one of Oregon's community colleges was interviewed. She participated in the project for a period of approximately three years.
- c. The CAL project coordinator, who was also the Director of MHCCREC, was interviewed. The Director of MHCCREC and the CAL Project Coordinator has been at MHCC for three years, responsible for coordinating collaborative efforts between the College and local high school districts. Previously, he was Principal at a local high school, worked for the Oregon Department of Education, and

served as an administrator in the Netherlands for an American high school.

- d. The President of Mt. Hood Community College was interviewed. He became aware of the CAL project upon his arrival at MHCC in May 2001. The former MHCC President had expressed his support for the CAL project through two written documents.
- e. Two faculty members from MHCC who have participated in curriculum development—one who was with the pre-engineering advanced manufacturing curriculum design process from the beginning and one who was responsible for coordinating curriculum development for the three career pathways.
- f. One representative from Oregon Institute of Technology who participated in the planning process of projects was interviewed, as well as one faculty member from Portland State University.

Two governmental representatives were interviewed, one representing local city government and economic development and the other a state legislator.

Participants were interviewed, and in five instances follow-up interviews were conducted to verify data and or gather additional data based on information obtained from other interviewees that required additional clarification.

Additionally, leads that developed from these initial interviews developed into new candidates for further interviews. These other candidates were interviewed if they were identified during the process as potential important sources of additional

information. Sampling continued as new data was obtained. Lincoln and Guba (1985) suggest sampling in a qualitative study to the point of redundancy:

In purposeful sampling the size of the sample is determined by informational considerations. If the purpose is to maximize information, the sampling is terminated when no new information is forthcoming from new sampled units; thus redundancy is the primary consideration. (p. 202)

Documents. Four hundred sixty nine documents pertaining to CAL design, development, implementation processes, decision making, and partnerships were cataloged. These documents include records of meetings, grant proposals, agendas, curriculum development documents, facilities planning, governance agreements, personnel decisions, equipment and instructional media documents, technology assessments, partnership agreements, e-mails and other communiqués, charter school applications, CAM documents, state legislation documents, briefings and presentations, policy and procedures documents, and contracts. Documents may be paper copy or electronic in nature.

Observations. Observations of facilities planning meetings, coordination meetings, curriculum development meetings, public meetings, partnership meetings and other observations of CAL meetings and activities were recorded as field notes. Observations were made during a nine-month period from August 2001 through July 2002. During that period six curriculum development meetings were attended, one summit meeting of superintendents, private sector CEOs, and legislative representatives, four governance meetings, and three operational meetings.

Table 7 provides a summary of who attended those meetings and what was discussed:

Table 7: Summary of Observations

Type of meeting	Attendees	Topics
Curriculum Development 10/11/01	Health sciences development team	<ul style="list-style-type: none"> • How can program options work into the curriculum • How will skills be presented • What will be covered in the courses • Standards and expectations
Curriculum Development 11/01/01	Manufacturing development team	<ul style="list-style-type: none"> • Distribute and review NIMS program • Discussion of the suitability of NIMS for CAL Manufacturing and its use as a model for Engineering
Curriculum Development 10/03/01	Information technology development team	<ul style="list-style-type: none"> • Work skills/team skills/human dynamics component • Integrating ECO classes into the curriculum • What will e-art/graphics, program language or design theory look like
Curriculum Development 12/24/01	Manufacturing development team	<ul style="list-style-type: none"> • Defining the capstone project • What are the outcomes for the capstone project • What are the parameters for the capstone project
Curriculum Development 1/16/02	Information technology development team	<ul style="list-style-type: none"> • What are the parameters and components • How does capstone relate to outcomes • What problem-solving model will be used

Table 7. Continued.

Curriculum Development 2/14/02	Health sciences development team	<ul style="list-style-type: none"> • Pre-requisite requirements for juniors prior to entering CAL • Entry requirements for students as they apply to CAL • Capstone projects
CEO meeting 8/24/01	3 superintendents, 2 legislators, 1 college president, CAL coordinator, 4 asst. superintendents, 5 industry representatives	<ul style="list-style-type: none"> • Design of Facility • Curriculum Development • Legislation Activity • What role should businesses play in the programs
Governance 7/11/02	Board	<ul style="list-style-type: none"> • National Charter School Conference highlights • Video development • Construction trades • Program timelines for key decisions • Involving high school principals
Governance 9/25/02	Board	<ul style="list-style-type: none"> • Number of slots per school • Equipment bids • Director position update • Transition plan to permanent Board • Waiver status
Governance 8/22/02	Steering committee	<ul style="list-style-type: none"> • Current status • Facilities • Curriculum • Marketing • Schedules • Counselor involvement • School year and calendar

Table 7. Continued.

Governance 3/14/02	Steering committee	<ul style="list-style-type: none"> • Facility update • Resource development • Board membership and decisions • Director FTE • Implications National Charter Conference
Operational 9/26/02	Principals	<ul style="list-style-type: none"> • Review graduation requirements at CAL and home high schools • Student brochures and counselor handbook • Marketing menu
Operational 9/12/02	Principals	<ul style="list-style-type: none"> • Facilities update • Marketing brochures • HR update • Partner and grant status • Calendar
Operational 9/04/01	Business manager, steering committee	<ul style="list-style-type: none"> • Cost of site • Cost of facilities • Business plan

Data Collection

Interviews. Seventeen interviews were audiotaped, producing approximately 20 hours of data, which was transcribed verbatim. Field notes were maintained regarding all interviews and conversations with respondents. Field notes reflect the researcher's experience in the multiple roles of researcher, observer, critic, and chronicler. These notes are descriptive, clearly offset from interviews and are intended to provide greater context and descriptions for the researcher and reader.

The interview protocol used was based on a recommended format by Creswell in *Qualitative Inquiry and Research Design* (Creswell, 1998). Each respondent participated in a 45-60 minute in-depth, open-ended interview. The questions were designed to determine what the individual being interviewed considers to be factual and what contributed to development of the CAL project.

The intent of the interview questions was to determine the duration of time the interviewee participated in CAL, the extent of experiences the interviewee had while participating in CAL development, and identify common themes related to CAL vision, curriculum development, partnerships, governance, logistics, and resource development. It was anticipated that during the developmental process, timing and certain advantages or barriers to private-sector participation and partnering would be identified.

Two sets of questions were asked, one for the educators and one for private sector representatives. Those questions asked of educators and private sector representatives focused on their experiences in the design, development and implementation processes of CAL, and their experiences regarding the development of partnerships. Three practice interviews were conducted utilizing one college faculty, one school district administrator, and one private sector representative. Based on the outcome of the practice interviews, the protocol guide was modified. See Appendix A for Interview Protocol Guide.

Documents. Documents were retrieved as paper or electronic files from the MHCCREC director, who was coordinating CAL development, and from the

assistant superintendent, who chaired the steering committee. Records kept by the project manager, project coordinator, curriculum development team leaders, partners, and participants in the design development and implementation processes were cataloged according to six key project components and analyzed. Documents were used to identify the time relationship of events, identify trends, and to corroborate events described by interviewees. The project coordinator identified project milestones and a timeline was developed.

Observations. Observations of curriculum development and facilities planning meetings, public forums, policy meetings, partnerships meetings, and other venues were recorded using an observation protocol guide (Appendix B). The observation protocol guide was used to capture the following data when formal meetings and activities were observed: 1) the situation observed, 2) conditions and setting of the observed activity, 3) individuals present, 4) the action/activity that took place, and 5) the results of the meeting activity. In addition, during informal meetings, conversations, and observations, the researcher kept field notes. The field notes were descriptive and recorded basic information regarding where an observation took place, who was present, and what social interactions and activities took place (Patton, 1990). Lofland (1971) indicates that, "Field notes are the most important determinant of later bringing off a qualitative analysis. Field notes proved the observer's *raison d'etre*. If (s)he is not doing them, (s)he might as well not be in the setting" (p. 102).

Data Storage

Data storage addresses the methods used to record and store collected data, the length of time data will be maintained, and the future disposition of data once it is no longer required to be maintained.

Interviews. Interviews were audio recorded, transcribed and coded. Audio, paper copies and electronic copies were maintained and preserved for analysis until the research project was completed and approved. The audiotapes of the interviews were erased and then destroyed when the study was completed. Paper copies of the transcripts of the interviews were destroyed and electronic copies were deleted/erased when the study was completed.

Documents. Documents were cataloged and returned to the appropriate individuals. The catalog and timeline was developed in electronic format and preserved for analysis. Electronic copies of all documents will be maintained for a period of three years following the completion of the study.

Observations. Observations as well as field notes were recorded in accordance with the protocol outlined in Appendix B and maintained until completion and approval of this research project. Records of observations will be maintained for three years in accordance with the OSU Human Subjects Institutional Review Board Handbook.

Human Subjects. A copy of the informed consent document is in Appendix C. When a participant orally agreed to participate in the study, a time and place for the interview was arranged. The informed consent document was explained to the

potential participant prior to or at the first meeting. The potential participant was interviewed only after their informed consent document was signed. Participants had an opportunity to ask any questions they had about the study before signing the informed consent document.

Any information obtained from the participants will be kept confidential as to its direct source. Participants were asked if they were willing to have the name of their organizations identified in connection with any pertinent statements. Only those who were willing to have such sources identified had any statements identified with their area. Only the organization was identified if the participant agreed in writing. Each participant's name has been disguised in the written study and, if needed, pseudonyms were used in transcripts and any reports or presentations. The only people who have access to original name information are the researcher and his major professor.

It was made clear to interviewees and those observed that: 1) participation was voluntary, 2) any information obtained from them would be de-identified and the informant remain anonymous, 3) the questions asked were from information gathered during a literature review on private sector-educational partnerships, educational reform and systems thinking, and 4) there are no foreseeable or direct benefits to the informants.

Data Analyses

Analysis of the data collected served to:

- Develop a timeline and identify life cycle processes of the CAL.
- Identify systems components that contribute to development of the CAL.
- Identify sources of leadership for the project.
- Identify education and private sector motivations for developing partnerships.
- Identify relationships between motivations, processes and practices that seem to encourage or discourage partnering and progress on the project.

“Data analyses [in a case study] consists of examining, categorizing, tabulating or otherwise recombining the evidence, to address the initial propositions of the study” (Yin, 1987, p. 99). Analysis utilized three methodologies: 1) pattern-matching, 2) explanation-building, and 3) time-series analysis.

Coding data. Transcribed interviews and documents were coded and cataloged based on the results of focus group feedback and the literature review. The CAL steering committee was used as a focus group and was asked to identify key components of the project. A key component was defined as a fundamental overarching element of the project that was required for success of the project. The focus group identified six key components that included: 1) vision, 2) partnerships, 3) governance, 4) curriculum development, 5) facilities, and 6) resource development. Background information was included as an additional category for purposes of coding the interviews and documents but was not used in the context of

a key component. The literature review indicated key characteristics of a system.

Those five characteristics were also used to code interviews and documents.

Pattern matching. Interviews were analyzed to identify and determine which variables contributed to the likelihood of partnerships developing and which did not, to identify the motivations of educators and private sector representatives, and to identify the key decision points in the design, development, and implementation processes.

Explanation building. Yin (1987) indicates that to explain a phenomenon implies a set of causal links about it. In a descriptive case study these variables may be imprecise to measure and therefore are better explained in a series of descriptive iterations. Interviews, observations, and documents provide three sources of descriptive data about the CAL. For example, interviewees discuss their experiences, which are then triangulated with other sources of data, including data from other interviewees, documents, and observations, to build reliable descriptions of the CAL development phenomenon. Similarly, data derived from documents can be compared with descriptions provided by interviewees to expand on a particular subject or event, provide corroboration, and assist in developing thick descriptions of events. This triangulation and building of the data provides context and contributes to building explanations of casual events.

Time-series analyses. A detailed timeline was built based on CAL documentation and information obtained through the interview process. It was anticipated that a detailed time series analysis would expose patterns related to key

decision points in the design, developmental, and implementation processes. Yin (1987) indicates the more intricate and precise the patterns uncovered, the more the time-series analysis will lay a firm foundation for the conclusions of the study. The developed timeline also resulted in the ability to trace changes in the speed of progress and changes of emphasis of the CAL project. The time-series analysis of the project further permitted matching data points to theoretical and emergent trends. Development of the CAL can be viewed in several phases. This study focused on the developmental phase of the life cycle of CAL. This phase is graphically represented as a timeline analysis.

Entry into the Field

Permission to research the project was granted by the project manager and all school districts agreed to provide open access to records, personnel, and meetings. The project manager was equally committed to assist in gaining access to the private sector, records, and potential respondents, agreed to permit access to all meetings and venues, and provided a letter of access, which was included in the human subjects Institutional Review Board application. Initially, research participants were recruited from a list supplied by the CAL project manager and project coordinator. It was anticipated that the initial group of interviewees would identify other potential subjects for interview. When information became available from documents, other interviewees, or observations that indicated interviewees

could provide new data or clarify existing data, follow-up interviews were scheduled.

Initially, telephone inquiries were made to determine participant willingness to participate in the study. During initial contact the participants were made aware of the research study, asked for a commitment to participate, and scheduled a meeting date and time. Respondents were provided confidentiality for their interviews and all individuals identified in correspondence, interviews, field notes and observations remained unidentified.

Summary

Chapter 3 describes the methodology used in this research study as a qualitative case study. The regional setting, environment, and demographics for the study are described in detail, which is the region surrounding Gresham, Oregon, the eastern portion of the greater Portland, Oregon, metropolitan area.

Although a qualitative case study presents data and conclusions through the interpretation of the researcher and is characteristically subjective, care has been given to utilize a variety of strategies, criteria, and consideration identified by Guba, Lincoln, Stake, Patton, Yin, and Creswell as critical to ensuring the trustworthiness of the research. Some of these strategies include: 1) triangulation of data, 2) member checking, 3) thick descriptions, 4) interview protocol considerations, 5) data collection techniques, and 6) clarifying researcher bias.

Three primary sources of data were used for this study: 1) seventeen interviews, 2) four hundred sixty nine documents, and 3) both formal and informal observations recorded as field notes. Several follow-up interviews were conducted to clarify or collect additional data. Collection and storage of data involving human subjects was handled in accordance with the plan submitted and approved by the Oregon State University Institutional Human Subject Review Board. All data collected was coded based on criteria developed from the literature review, a focus group, and information identified by the researcher as fundamental to answering the research questions. Coded data was stored electronically, which facilitated the ability to sort and cross reference all sources of data, conduct word searches, and identify themes.

CHAPTER 4

FINDINGS

“Participation, seriously done, is a way out from the uncertainties and ghostly qualities of this nonobjective world we are living in. We need a constantly expanding array of data, views, and interpretations if we are to make wise sense of the world... An organization rich with many interpretations develops a wiser sense of what is going on and what needs to be done. Such organizations become more intelligent” (Wheatley, 1999, p. 66).

The purpose of this study was to investigate the Center for Advanced Learning developmental process and gain understanding of the factors contributing to progress of this educational reform partnership project. The study answered the following five research questions:

1. Why did representatives from the private sector choose to partner with the CAL?
2. Why did some potential partners choose not to partner with the CAL?
3. What are the systems components that contributed to developing this collaborative educational reform project?
4. How did systems components of the developmental process encourage sustained progress?
5. How did educational and private sector systems interact and contribute to the success of this project?

Introduction

This chapter reports the development of the CAL, the relationship of key developmental components, the relationships of partners, and the dynamics as the organization emerged. Data reported in this chapter are from 17 interviews with participants in the CAL project who have firsthand experiences, analysis of 469 documents associated with all phases of development, and observations from several key meetings with education, government, and private-sector leaders. In general, the interviewees were very forthcoming with their responses to the questions, which were consistent with the events and relationships articulated in documents and observations. Triangulation of data from these three sources provided a balanced and reliable picture of the process and dynamics involved in the emergence and development of the CAL organization.

All interviews were transcribed and coded. The transcriptions do not adequately convey participant enthusiasm, frustrations, and passion for the project. Some interviewees had a much broader perspective than others and their scope and duration of participation varied from six months to three individuals who have been involved the entire five years. Their perspectives range from narrow, experiencing only the curriculum development process or advising in a particular area of specialty, to perspectives of others who have been involved at all levels and have a much broader view of the project.

Documents provided accuracy related to timelines, numerical data, the official nature of relationships between participants, a view of the evolving scope

of the project, and insight into the complexity of interrelated components.

Categories for document cataloging are the same categories used in coding interviews to assist in cross-referencing data. Coding categories relating to key CAL components are: 1) vision, 2) partnerships, 3) governance, 4) curriculum development, 5) facilities, 6) resource development, and 7) background information. Documents provided a linear framework for understanding the dimensions of time and evolution related to the respondents' experiences. Documents also provided a high degree of accuracy in charting trends. Documents cataloged included agendas, newspaper articles, timelines, correspondence, e-mails, grant applications, curriculum, PowerPoint presentations, notes, and other related papers.

Observations provided insight into the ebb and flow of conversations regarding project considerations in which decisions were made and relationships and partnerships emerged. The researcher considered impressions of the participants, their comments in relation to others, and how their comments related to the documents and observations. Observations provided additional context and meaning for the other data sources. Observations included six curriculum development meetings, one CEO meeting, four governance meetings, and three operational meetings. All meetings were open public meetings except the superintendent/chief executive meetings.

Participant Characteristics

Seventeen individuals were interviewed and those interviews transcribed. Interviewees represented a cross section of education, private-sector, and governmental representatives who had different experiences and insights into the development of the CAL.

At the time of the interviews, nine interviewees were employed in education representing secondary, college, and university perspectives at both the faculty and administrator levels. All had roles in the development of the CAL. Two education interviewees were community college presidents; one had also formerly served as a superintendent of one of the participating school districts. Both had been with the project from inception but had departed for new positions in 2000. Two of the nine interviewees represented two different universities, one providing a university faculty perspective and one providing an administrator perspective. The faculty member participated in the pre-engineering/manufacturing career pathway curriculum development process and the university administrator was responsible for articulating the CAL programs into the university he represented. Six interviewees were from secondary school districts and were administrators and faculty.

Five interviewees represented five different private-sector organizations and the three industry segments represented in the CAL career pathways (information technology, pre-engineering and manufacturing, and health sciences). Two of these private sector representatives were mid-level production managers and three were

managers responsible for education and training program development and implementation in their organizations.

Eight of the interviewees are female, four represented different private sector organizations, two represented education—one at the community college and one at the school district levels, and two represented governmental agencies—one at the local level presenting an economic development perspective and one at the state level responsible for legislative action.

Five of the interviewees had been with the project from its inception, while the least amount of time any interviewee was affiliated with the project was one year. Table 8 represents general characteristics of the seventeen individuals interviewed.

Table 8. Interviewee Characteristics

Interviewee	Sector Represented	Occupation type	Duration of participation	Did organization partner?
1	Education	College administrator	Mid 99-current	Y
2	Private-sector	Manufacturing consultant	From the beginning-99	N
3	Private-sector	Production manager	01-02	N
4	Education	University faculty	01-02	N
5	Education	High school administrator	98-00	Y

Table 8. Continued.

6	Education	High school administrator	From the beginning-current	Y
7	Education	High school administrator	From the beginning-Current	Y
8	Education	University executive director	00-02	N
9	Private-sector	Mid-level manager	From the beginning-current	Y
10	Government	Mid-level manager	Early 99-01	N
11	Education	College faculty member	Mid 99-current	Y
12	Private-sector	Mid-level manager	Mid 99-current	Y
13	Education	High school administrator	From the beginning-current	Y
14	Education	College faculty member	Mid 00-current	Y
15	Private-sector	Production manager	99-current	Y
16	Government	State legislator	From the beginning-current	Y
17	Education	College administrator	98-99	Y

Data Collection

Three sources of data were used: 1) 17 interviews, 2) 469 CAL related documents, and 3) observations of meetings. The researcher conducted all interviewing during January-April 2002. Transcription and coding of interviews was done concurrently and completed by June 2002. Observations were conducted informally between spring 1999 through fall 2001. Formal observations were conducted January 2002 through June 2002.

Interviews

Comments by the interviewees were initially organized and coded according to six CAL components identified by the CAL steering committee. The six key CAL components are: 1) vision, mission, and goals, 2) partnerships, 3) governance, 4) curriculum development, 5) facilities, and 6) resource development. A seventh category, background information, was also used for coding purposes, but was not identified as a key component.

Seven systems thinking characteristics were also used to code and catalog interviews based on results of the literature review. Those systems characteristics included: 1) self-regulating, 2) self-organizing, 3) self-reproducing, 4) energy, 5) strange attractors, 6) multidimensionality, and 7) feedback. These categories were selected to place CAL development in the context of a systems thinking framework.

Interviewees were asked their general experiences relating to CAL development, and more specifically, to describe their perceptions regarding: 1) efficiency of project development processes, 2) reasons for sustainability of project development, 3) things that should have been done differently, 4) significant influences on the project, and 5) what they viewed as key project components. These specific topics were also used as part of the coding and cataloging scheme to facilitate cross-referencing and sorting data according to themes that were important in answering the research questions.

Documents

The 469 CAL related documents were collected, organized, coded and analyzed using the six key CAL components identified by the focus group [steering committee]. Coding into these categories provided an efficient method of retrieval, searching, organizing, and cross-referencing data electronically with the interviews and the observations. Documents were used in a variety of ways to develop timelines, and cross-reference data provided by interviewees was used to verify accuracy, provide additional context to interview results, and to examine the frequency of the appearance of topics and themes for patterns. For example, the documents provided context in the following manner: 1) frequency and types of meetings were examined to determine when in the development process more effort was dedicated to a particular topic or initiative, 2) what the content of written agreements were, 3) formally expressed concern about elements of the project, 4)

established an audit trail and the changing nature of project elements, and 5) the extent of influence a particular entity may have had on the project, to name a few.

Documents were also used to identify and verify supporting data related to systems dynamics. For example: 1) formal feedback loops were identified through meeting agendas and minutes, 2) assigned tasks were identified, 3) correspondence between participants was examined, 4) governance-coded documents provided insight into self-regulation, while earlier documents provided insight into self-organization of the project, and 5) patterns of frequency and effort helped identify strange attractors.

Observations

Formal observations were conducted of 14 meetings. Those meetings included curriculum development, facilities development, resource development, and partnership meetings. Individuals participating in those meetings included CEOs and mid-level managers from the private sector, college presidents, secondary and postsecondary administrators, secondary and postsecondary faculty members, and federal and state legislators. Observations were recorded and categorized as appertaining to one of the six key CAL components, while organizational dynamics and systems components were considered and recorded during the course of these meetings. Informal observations were made from 1999 through 2001, primarily of initial organizing and coordination meetings and of the curriculum development process. These early informal observations informed the

researcher about: 1) the potential of the project, 2) significance of this project for the State of Oregon as an educational reform model, 3) insight into the significant effort required to develop a new educational model within an entrenched system, and 4) the significant amount of energy [time and effort] that needed to be expended to create alignment with the project in the region.

Data Organization

Consistency and interrelatedness of coding categories for all data sources provided the ability to cross-reference and triangulate information electronically. Interviews, documents and observations were coded according to the six key CAL components identified by the steering committee, while interviews were also coded using systems theory components. Sources of data were also categorized by system characteristics and project dynamics to assist in the electronic cross-referencing of components and systems dynamics. Table 9 displays the categories of coding for interviews, observations and documents.

Table 9. Sources of Data and Coding Categories

Interviews, Documents, and Observations		
Key CAL components	Project dynamics	Systems thinking characteristics
1. Vision	1. Efficiency	1. Self-regulating
2. Partnerships	2. Done differently	2. Self-organizing
3. Resource development	3. Sustainability	3. Self-reproducing
4. Curriculum development	4. Influences	4. Energy
5. Governance	5. Key elements	5. Attractors
6. Facility development		6. Multi-dimensionality
		7. Feedback

Findings are presented in a framework of six CAL components identified by the steering committee as key divisions of work and are consistent with the interview coding categories: 1) vision, mission and goals, 2) partnerships, 3) resource development, 4) curriculum development, 5) governance, and 6) facilities development. There is no significance to the order in which they are presented. These findings follow a description of the contextual environment, which provided the strange attractors that influenced development and emergence of the CAL.

Time Analysis

Table 10 represents milestones in the CAL developmental process. These milestones span a period of four years seven months, and represent events that contributed to CAL development and that were identified in documents and/or articulated through interviews as being important:

Table 10. CAL Milestones

Date	Milestone
07/01/98	Initial meeting with three proponents to discuss regional professional technical training center as a way to promote a better prepared workforce
10/29/98	Professional Technical Training Center regional strategies proposal presented
11/25/98	Potential regional private sector partners identified
05/05/99	Partnering school districts begin planning meetings
05/27/99	Governor signs Oregon Public Charter School bill into law
10/05/99	Tech-Prep Center design teams begin meeting
10/18/99	Curriculum development discussions begin
02/16/00	Ketiv Technologies commits as first private sector partner
02/28/00	Curriculum development consultant hire
03/30/00	\$10,000 charter school planning grant awarded
06/09/00	CAL core group facilitates facilities planning workshops
07/07/00	Architects begin meeting with school districts
10/07/00	\$6.8 million CAL bond initiative passes at Reynolds and Gresham School Districts
11/10/00	State Charter School Planning grant approved for curriculum development
01/10/01	MHCC pledged to reimburse CAL for post secondary enrollment
08//25/01	Superintendents meet with private sector partners, Boeing, Intel, LSI, and Legacy Health System
05/01/01	Gresham-Barlow accepted the charter school proposal allowing for ODE charter school implementation grant funding
06/01/01	State representative Karen Minnis pledges \$800,000 for the CAL
06/05/01	CAL public charter school proposal completed
07/01/01	MHCC pledges \$2 million in bond support for the CAL
07/01/01	Centennial School District pledges \$1.5 million for the CAL project
10/10/01	Ground breaking ceremony
12/1/01	Centennial School District decides to partner
8/1/02	Corbett School District decides to partner
03/30/03	CAL Director hired

A timeline overview beginning June 1998 through September 2003 is presented in Figure 1. The intent of this timeline is to provide context for events critical to the development of the CAL and represents the juxtaposition and

duration of the CAL development events and partnership affiliation. Key events represented include initial coordination meetings, curriculum development duration, charter school legislation, facility development and construction, bond passage, partnership affiliation, and the hiring of key individuals. Other events not represented in Figure 1 are referenced in greater detail in the narrative presentation of the data.

The timeline was developed using data collected from interviews, documents, and published articles. Each element depicted was cross-referenced with at least one other data source to ensure accuracy. All data and anticipated events represented on the timeline occurring after the researcher completed interviews and formal observations are represented by a dotted line. The timeline spans approximately five years.

Figure 1. CAL Development Timeline

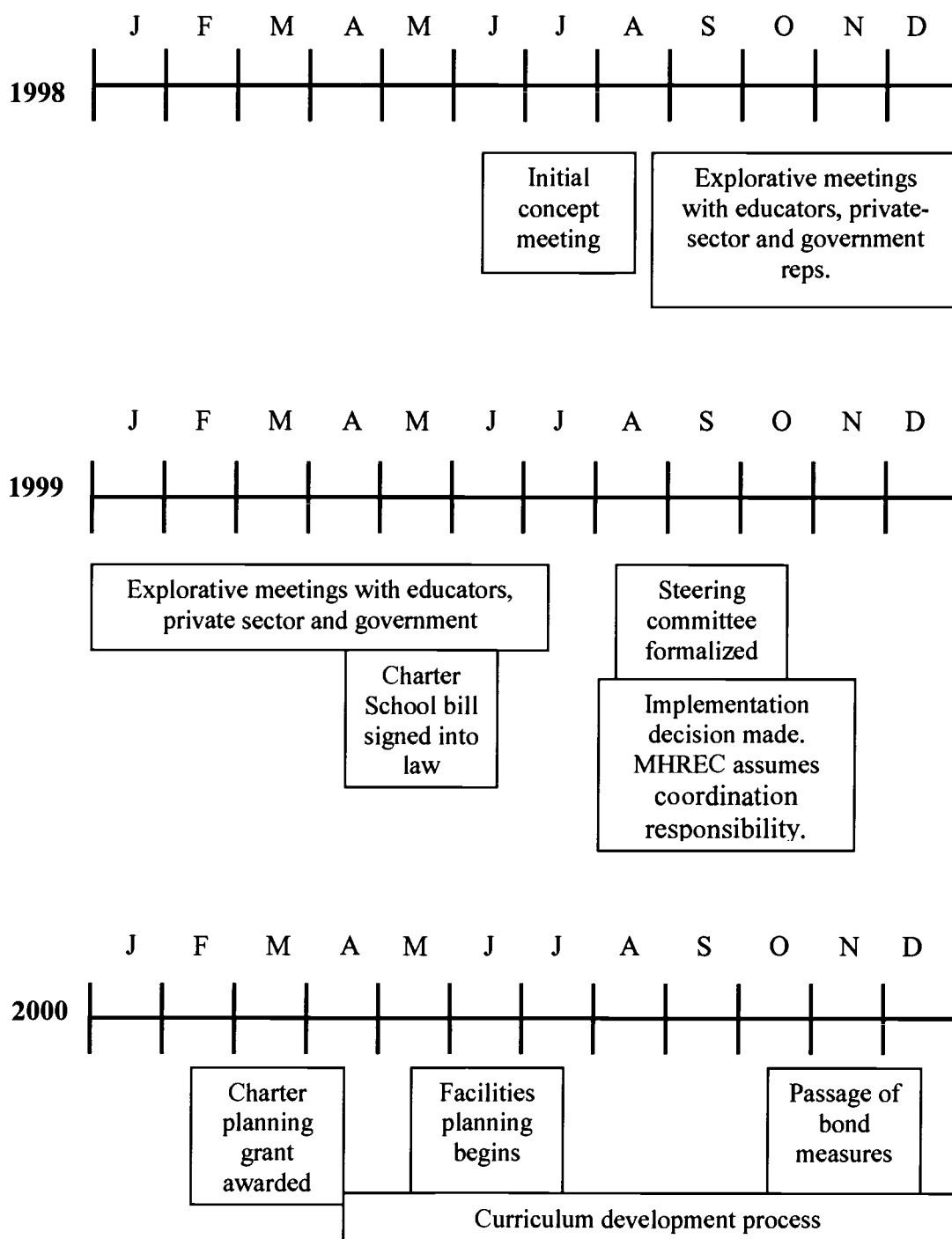
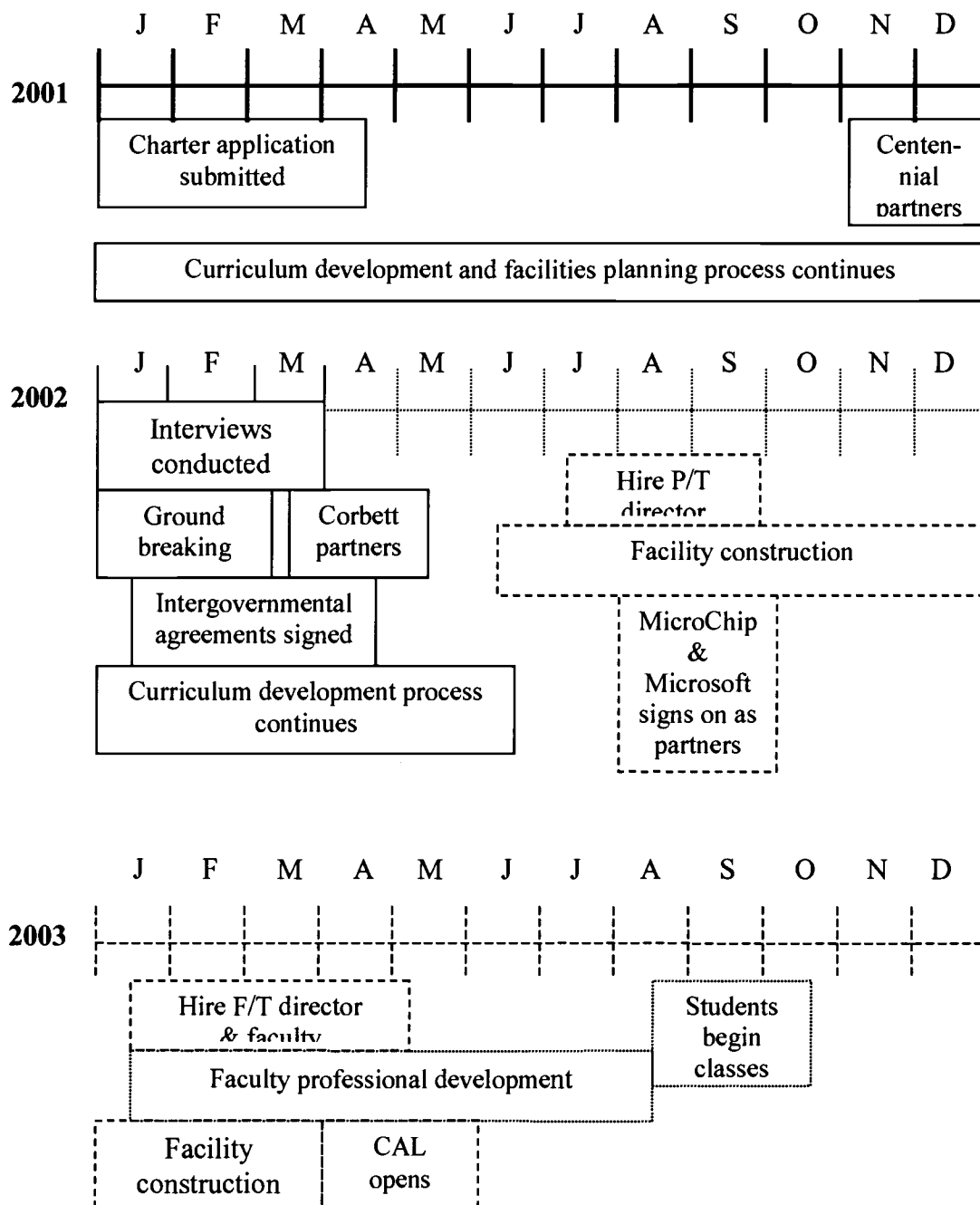


Figure 1. (Continued)



Contextual Environment and Strange Attractors

“Spatial blindness is about seeing the part without seeing the whole. Temporal blindness is about seeing the present without the past” (Oshry, 1995, p. 27).

To know the genesis and development of the CAL is to understand a context in which environmental forces contributed to emergence of purpose, function, process, and structure in an iterative circular relationship that shaped the CAL creation. These dynamics are characteristic of an evolving living system.

A description of regional demographics during the development of the CAL is provided to give context to the environment that influenced choice, chance, and certainty of the CAL development.

Oregon Landscape

During the last two decades, the Oregon economy has reduced its dependence on natural resource-based industries and has come to rely on increased industrial diversity, including metals fabrication, transportation, electronics, and high-tech microelectronics manufacturing. Beginning in the early 1990s, timber harvesting was dramatically reduced and high technology manufacturing grew from 16 percent of Oregon’s manufacturing employment to 22 percent by 1998. Oregon’s economic base now includes high-technology industries, forest products, agriculture and food processing, tourism, primary and fabricated metals, and transportation equipment.

The rapid economic growth that began in the late 1980s had absorbed much of the region's labor supply. The jobless rate had fallen to 4.4 percent by 1998. With unemployment at a near record low and projected retirements on the rise, employers were concerned about the future source and qualifications of employees. The high-tech manufacturing industry was importing upwards of 90 percent of its labor needs (Oregon Employment Department, 2001a).

Between 1990 and 1998, manufacturing employment nationwide lost 718,000 jobs, a decline of 3.8 percent, while during this same period manufacturing in Multnomah County gained 18,000 jobs, an increase of 22 percent. Over two-thirds of these new jobs were in high-tech manufacturing, consisting of computer and office machinery, electronic equipment, semiconductors, modems, communications equipment, and instruments and related products. During this same period, manufacturing of transportation equipment peaked, as did as metals manufacturing. The construction industry in Multnomah County added 12,000 jobs during this period, for a net gain of 57 percent. Overall, between 1990 and 1998 employment grew by 31.5 percent, while nationally, employment had grown by 19.6 percent (Oregon Employment Department, 2001b).

Employment projections for the next ten years indicated significant growth in professional-technical occupations that included health service workers, information technology support specialists, semiconductor processing, computer and manufacturing engineers, and the construction trades.

Results of the Oregon Employer Survey reinforced the belief that the region was facing a shortage of available and qualified labor into the next decade.

Importantly, 56 percent of respondents were not satisfied with applicants' problem solving or critical thinking skills. Work ethic and interpersonal communication skills were also cited as significantly lacking in new applicants. Among the top ten job skills employers identified as important, four related to computer literacy.

Many high school career and technical education (CTE) programs were disappearing as funding for secondary schools became tighter and career and technical educators were retiring with no replacements in the emerging workforce. Industry was concerned about the source and quality of their future workforce.

Population

Between 1990 and 2000 the Oregon population increased by 579,000, which was more than double the increase from the previous decade. This 20 percent gain ranked Oregon the 11th fastest-growing state, compared with a 13 percent average growth rate in the United States. Between 1990 and 1999, approximately two-thirds of Oregon teenagers were in the labor force. Of Oregonians age 16 and older, approximately 75 percent of Hispanics were in the labor force compared with 68 percent of all Whites. Multnomah is Oregon's smallest county, yet the most populous with 700,000 residents. Gresham, the fourth largest city in Oregon has a population of 90,000. The diversity of Multnomah County is indicated by the fact the population is 79 percent Whites,

nine percent Hispanic, six percent Asian, and six percent Black. The fastest growing segment of the population is the Hispanic community (Oregon Employment Department, 2001a).

The Metro Data Resource Center (1998) projects the college district population growth rates by ethnicity from 1997-2020 as follows:

Table 11. Projected Ethnic Population Growth in MHCC District

Projected college district growth 1997-2020			
Population ethnicity	Percentage increase	Population growth from	Population growth to
Hispanic	305%	10,907	44,137
African American	224%	4,954	16,038
Asian	183%	15,393	43,603
Indian	78%	3,770	6,713
White	47%	353,184	519,180
Other	62%	216	350

Table 12 provides relevant demographics across the participating high schools. It should be noted that based on the projected demographics from Table 7, and compared with the existing demographics from participating high schools, it is anticipated those high schools will experience significant changes over the next few years.

Table 12. Student Demographics Across Participating High Schools in 2002

Demographics in 2002	Percentage
Rate of average attendance	93.5
Rate of average GPA	2.65
Average SAT/ACT scores for Seniors	Verbal—517 Mathematics—525
Percent of students of free lunch program	22.4%
Percent of students taking the SAT/ACT's	43%
Percent of students going to two- or four-year colleges	Two years = 38.5% Four years = 37%
White	84.09%
Black	2.34%
Hispanic	7.44%
Asian/Pacific	5.44%
American Indian	0.69%

Education

In 1990, 24 percent of Multnomah County residents had received a two-year college degree or higher. By 2000, that percentage had reached 31 percent, and during that same period residents who had not completed high school declined from 17 percent to 13 percent, while the overall adult population continued to increase. Data from the Oregon Employment Department (2001a, 2001b) indicates that during the same period unemployment was directly related to educational attainment. For example, the unemployment rate for those who had attained an Associate's degree was 2.3 percent and 1.8 percent for those who had attained a Bachelor's degree, while the unemployment rate for high school dropouts was 6.4 percent.

In 1998 the Oregon Department of Education required implementation by 2004 of the Certificate of Initial Mastery (CIM) for 9th and 10th graders, and the Certificate of Advanced Mastery (CAM) for 11th and 12th graders (Oregon Department of Education, 2000). The CIM was an effort to improve basic academic standards in English, mathematics, science, social science, second language, the arts, and physical education. The purpose of the CAM was to assure that each student: 1) prepares for successful transitions to postsecondary schooling, employment, and adult responsibilities; 2) is actively engaged in her or his own educational planning and takes responsibility for his or her own learning; 3) applies high level academic and career related knowledge and skills in relevant and meaningful learning experiences; and 4) is supported by the school, parents, and community to achieve success in learning and accomplishing his or her goals.

In order to achieve CAM certification a student must: 1) develop an educational plan and build an educational profile; 2) demonstrate extended application of academic and career-related knowledge and skills through a collection of evidence; 3) demonstrate career related knowledge and skills in problem solving, personal management, communications, teamwork, organization and systems, employment foundations, and career development; 4) participate in career related learning experiences as outlined in his or her educational plan in the workplace, community, or school; and 5) meet the CIM academic requirements (Oregon Department of Education, 2001c).

Oregon State legislation was passed in May 1999 that permitted the establishment of charter schools. The Oregon Public Charter School Legislation set forth the following goals: 1) increase student learning and achievement, 2) increase choices of learning opportunities for students, 3) better meet individual student academic needs and interest, 4) build stronger working relationships among educators, parents, and other community members, 5) encourage the use of different and innovative learning methods, 6) provide opportunities in small learning environments for flexibility and innovation which may be applied, if proven effective, to other public schools, 7) create new professional opportunities for teachers, 8) establish different forms of accountability for schools, and 9) create innovative measurement tools (Oregon Department of Education, 1999a).

The region and the nation were concerned about preparing the next generation for the world of work. Alan Greenspan (2001), in an address to the Department of Labor 21st Century Workforce Summit, indicated that:

The notion that the formal degree programs at any scholastic level or that any other training program established today can be crafted to fully support the requirements of one's full working life has become subject to increasing doubt. It is evident that we need to foster a flexible education system—one that integrates work and training and that serves the needs of both experienced workers at different stages in their careers and of students embarking on their initial course of study... technologically advanced learning must be grounded in real world curriculums that are relevant to changing business needs. (p. 2)

Additionally, the public was becoming increasingly concerned with the higher costs of education and was demanding better student performance for their

investment. State budgets were shrinking and economies of scale were a welcome notion. The public wanted more accountability in the education system and was looking at educational reform initiatives and potential education-private sector partnerships to help solve those perceived problems. These regional environmental pressures created a climate that was ready for change (Oregon Business Council, 2000).

Workforce Concerns

In late 1998, concern for quality and future supply of a skilled workforce, the state of K-12 education, and direction of the economy within the region led three individuals—Suzzie Mazzio, representing the Boeing Company Portland; Lynne Wolters, representing Mt. Hood Community College and Oregon Advanced Technology Consortium; and Cindy Carrell, a metals industry consultant from Dotten and Associates who had worked with the Oregon Metals Industry Council (a lobbying group of primary metals companies and closely related metals operations that have come together to speak with one voice on issues of specific concern to metals industry)—to come together to discuss a regional strategy that would address those concerns. Their focus was to address regional manufacturing issues and how education, the private sector, and governmental agencies could collaborate within the region to meet their future workforce needs. Those considerations, along with the condition of the state educational system, regional

economic environment, and changing demographics, provided an impetus for change (Carrell, C., 1998; Oregon Business Council, 2000).

Strange Attractors

Strange attractors arise from the interaction of social systems with their environment and create a strong attraction or repulsion towards the edge of chaos [disorder]. They act as a magnet influencing a purposeful system, one capable of choosing ends and means, in a particular direction. The result of this interaction between purposeful systems and the environment is self-organization and the emergence of unpredictable patterns. These patterns result from interaction of choice and chance and may represent small changes. Although resultant combinations may be small, their effect may be amplified repeatedly by self-reinforcing feedback. For example, strange attractors serve to inform individuals, which in turn alters their perceptions and their behavior. Therefore, what people do influences and alters social systems that ultimately alter the future. This nonlinear form of feedback is the basis of instabilities and the sudden emergence of new forms of order that are characteristic of self-organization in living systems (Capra, 1996; Gharajedaghi, 1999; Pascale et al., 2000; Senge, 1990; Weinberg, 2001; Wheatley, 1999). One of the initial members sums up the strange attractors that brought this initiative forward:

There was a strong need to try to develop a local workforce, especially in some high-end positions around some local companies that really felt like they had to go out way beyond this

county to find employees that met their needs so those combinations of the K-12 educational programs not having what we wanted to have, and industry not getting what they wanted—a pipeline of students for their programs. It was the right time in the economy.... The fact the Gresham area has quite a bit of developable land available was helpful.... And one of the interests [industry] had was to try and consolidate the assistance [from industry] so instead of support to five high schools individually they could help one (Interviewee #2, January 9, 2002).

Concurrently, Gresham Barlow School District was looking into the potential development of a Technology Learning Plaza. Their focus was on developing an information strategy for the public that would create the synergy necessary to carry their project to fruition. The strategy included: 1) exposing parents and key members of the community to the school laboratories that were already in existence, 2) bringing together 25 to 30 key individuals, to spend two days in the laboratories, who would form a nucleus network to influence public opinion, and 3) identifying candidates for participation on a steering committee, the purpose of which was to provide direction for moving the project forward. Those candidates included four staff and board members from Mt. Hood Community College; representatives from Multnomah County, the City of Gresham, Superintendents Business Advisory Committee, Reynolds and Centennial School Districts, and private schools in the area; representatives of large nurseries; the Portland Development Commission; LSI Logic; Fujitsu and other high-tech companies; and representatives of smaller companies identified by the Chamber of Commerce (Buck, 1998).

Collectively, the steering committee members were familiar with local businesses, politics, educational entities, and the community, which provided insight and experience into how to disseminate information about the project. Utilizing community connections proved useful developing a network that assisted in disseminating information and gaining broad public acceptance and support for the development of the project that was to become the Center for Advanced Learning. The development strategies and the strategic decisions used to develop the experience from the Technology Learning Plaza provided feedback to the steering committee about how to engage public support for an educational project, which fortuitously allowed the organization to learn how to successfully guide the larger Center for Advanced Learning project. The recent experience and lessons learned with the Technology Learning Plaza were important because the system had not had time to be sufficiently perturbed and altered. It was therefore suspected that the recently learned lessons in engaging public support for an educational project could contribute to the potential for success of a similar project.

CAL Components and Development

What difference would it make if we could see the unfolding stories of our various system lives—the family, the organization, the community, our circle of friends—if we can see how we and others got to this point in time?

What difference would it make if we could see the day-to-day events of life not as isolated events but as pieces of a rich tale with form, and pattern, and direction? (Oshry, 1995, p. 36).

On February 24, 1999, Mazzio, Wolters, and Carrell called an initial meeting with education, government, and private sector leaders to discuss the concept of a regional professional technical center. The Director of Community Development for the city of Gresham provided an overview of future developments planned in the area, including the development of a business park in the Columbia Corridor that potentially would add 8,000 jobs to the region. The Director of Professional Technical Education for North Clackamas School District discussed their regional professional technical center (SABIN Skills Center), and House Bill 2006, which would provide seed funding for future development of regional skills centers throughout Oregon (Carrell, 1999a).

We [members of this initial planning group, which included private-sector, education, and governmental representatives] did a series of visitations out to companies. We would talk with people at the Chamber and to the business development department at the city of Gresham. We then explained what the concept was and got them to SABIN Center if they were really interested and then talked about how we would better use resources by concentrating their resources at the Center. Everyone was pretty disturbed by what was going on at the schools at the time. ...Sabin [Skills Center] was definitely our model (Interviewee #2, January 9, 2002).

A second meeting was conducted on March 30, 1999, at Quadrant Precision Manufacturing. The superintendent of Reynolds School District chaired the meeting and the following topics were discussed: 1) industry workforce needs and current school partnerships, 2) school resources for professional technical services, and 3) prioritizing areas of strength and relative need (Carrell, 1999a).

The third meeting, conducted on April 21, 1999, focused on brainstorming programs in four disciplines identified from the previous meeting as important workforce needs for the future. Those disciplines, which also had potential for education-private sector partnerships, included high-tech manufacturing, information technology and communications, travel and tourism, and health care (Carrell, 1999b).

Other broad ideas captured by the planning group as part of developing a vision for the imagined regional skills center suggested the need to: 1) build a network of relationships, 2) include entrepreneurial activities and ideas, 3) introduce students to positive workplace attitudes, 4) utilize the Internet as a tool for both marketing and providing virtual tours for students, and 5) implement programs that are “value added” compared to programs offered at a single high school (Carrell, 1999b).

Work groups were established that correlated to the four academic disciplines of interest and each group was asked to determine: 1) what is the need in the region for this program, 2) what are the regional businesses that employ these skills, 3) what are the key elements of this program that students need to experience, 4) what current programs are delivered in the region, 5) how would the program offered at their regional center link to these current programs, 6) what entrepreneurial experiences can students gain in this area, 7) which regional center model would best serve this program, 8) what resources are needed to develop this program, and 9) how can this program also serve adults and post-high school

student needs, as well as the needs of businesses to enhance current workforce skills (Carrell, 1999b).

In fall 1999, the planning grant which funded the regional skills center feasibility study expired and a decision to continue the work was made by the president of MHCC and three superintendents from the participating school districts. They appointed Bill Lesh, Director of the Mt. Hood Regional Education Consortium (MHREC), an additional duty of continuing the coordination effort. It was felt that Bill Lesh was ideally situated with links between MHCC and the high schools to provide a sustained and collaborative effort. At that time a steering committee was also appointed that included Lesh and three assistant superintendents from the participating school districts. Their charge was to continue to explore options and develop the idea of a regional skills center.

Potential partners had been identified, resourcing the project needed to be addressed, and coordination with community and private sector leaders to move the idea along was critical.

Once this project was handed off to Bill Lesh, he was able to generate more stakeholders. The city of Gresham became a stakeholder also. I think they were interested in us being part of the package that would attract businesses to the area. It was part of their business recruitment plan (Interviewee #2, January 9, 2002).

In surveying the landscape, legitimate questions surfaced and were asked by the MHREC Director: 1) Are all key players included? 2) Are all concerns being discussed at the table? 3) Do the participants have the will to follow through? 4) Are the participants all focused on improving educational opportunities for our

young people? (Lesh, 2000a). The next step became creating and clarifying a vision and goals that educators, representatives of the private sector, and government could embrace.

So I think we were trying to see how can we create in these contacts points of intersection. Where do the business lines intersect with the school interests... I'm trying to see at what point of intersection was all this going to come together and create sort of a critical mass of interests that you can build upon (Interviewee #13, March 15, 2002).

Vision/Mission/Goals

Vision is identified by 12 of the 17 interviewees as one of six key elements of the project, a key influencer of the community, or contributing significantly to the sustainability of the project. As a result of the interview coding process, vision was identified by 13 of the 17 interviewees as an important and contributor to self-organization. Vision was also identified six times in interviews as an energy source for the project, 19 times cross-referenced as a strange attractor, and 14 times as contributing to self-regulation. Margaret Wheatley suggests that vision or a sense of "self" is a strange attractor in organizations (Wheatley & Kellner-Rodgers, 1996). She indicates that vision is what creates alignment and holds us together within the boundaries of a system.

Lashway (1999), in addressing trends and issues facing school reform initiatives, suggests that a key step is the development of a vision that reflects the values and commitments of the stakeholders. He states that:

A persuasive vision will energize support for change and establish a standard of excellence that people can rally around. However, most studies of school change show that vision is not a one-time event or a static statement of intent; rather it continually evolves through trial and error. (p. 7)

The evolving vision was an ongoing effort that encompassed opportunities for change through national and state educational reform movements along with significant industry development of information technology and manufacturing national skill standards (Lesh, 2000a). One influential governmental official took particular pride in the vision and indicated:

I talk about East county and the vision that our school districts have, not just for education but for workforce training and economic development. This is one of the shining lights I think of, the achievement of people in the East county area (Interviewee #16, April 1, 2002).

Initial focus for a regional skills center was on manufacturing. In October 1999 the East Multnomah County Regional Professional Technical Center strategic plan development proposal summary indicated:

The industry's technological innovations demand a workforce of learners. The growth of the future is hampered by the lack of skills in today's workforce and by a declining number of students entering technical careers.

The summary of that planning document went on to state:

We envision an East Multnomah County Regional Professional Technical Center (RPTC) for the delivery of workforce skills and abilities to meet current featured industry technology demands. A full array of manufacturing business environments will drive the offerings within the Center. These may include advanced equipment operation and maintenance, CAD/CAM design, environmental safety and hazardous materials handling,

occupational health and safety, and information technology (Carrell, 1998).

The mission of the CAL outlined in the 1999 strategic plan document stated:

In addition to providing excellent professional technical and career learning opportunities the Regional Center will only be accomplished with full participation and open exchange between the region's education providers, businesses, and government (Carrell, 1999c).

Vision for the Center also included a network of existing manufacturers and high school manufacturing programs willing to collaborate that could leverage access to more modern equipment for students. It was anticipated that initial course offerings would begin in 1999 at a local aerospace manufacturing company willing to provide excess space for use as a classroom. That concept was not brought to fruition and the company eventually receded from participating in the project. That company was a subcontractor of Boeing, and with Boeing as a driving force in the project, it was believed the commitment and offer by the subcontractor was made for ulterior motives.

This early strategic plan indicated that goals of the Regional Professional Technical Center were to: 1) increase access to manufacturing education for high school students so that more qualified students could enter manufacturing careers, 2) increase the skills of future and existing employees to improve the competitiveness of Oregon's manufacturing industry, 3) increase opportunities for manufacturing businesses to train employees cooperatively and cost-effectively,

and 4) provide meeting and training space for East Multnomah County industry partners (Carrell, 1998).

The strategic plan further articulated perceived community benefits: 1) provide students an exciting venue in which to learn about the latest manufacturing technology, thereby engaging students in their own education and furthering their desire to learn core mathematics, science, and communication skills, 2) allow students to accomplish educational goals to help them earn their Certificate of Initial Mastery and Certificate and Endorsement of Advanced Mastery, 3) introduce students to family wage careers in manufacturing, 4) promote and demonstrate the connection between high school education and further education, 5) promote within manufacturing companies continuing education for all employees, 6) provide an example of cooperative community planning to make a significant change in education, and 7) support existing and welcome new manufacturers to the East Multnomah County region (Carrell, 1998).

The Oregon Metals Industry Council, The Boeing Company, and Quadrant Precision Manufacturing made the initial proposal for development of this East County Regional Professional Technical Center while Mt. Hood Community College, the City of Gresham, the Gresham Chamber of Commerce, and Atlas CopCo Wagner supported it. This developmental project was to begin in September 1998 and continue through February 1999. Total developmental costs of the project were estimated at \$260,000.

The President of Mt. Hood Community College indicated his support for the development of this project in August 1998.

In the 1997 Oregon Metals Needs Assessment, employers cited workforce development issues most often as a major impediment to growth. The Regional Professional Technical Center will provide needed training on the most advanced machinery to enhance the skills of the current workforce and prepare our young people to enter this well paying profession in the future. Mt. Hood Community College stands ready to partner and collaborate with the industry as well as the area school districts in this project. This public-private partnership embodies the true components of community building (Vela, 1998).

In the next iteration of the vision, the name was changed to the Center for Advanced Learning, and it indicated the Center would provide innovative, advanced education for grades 11 and 12 as well as industry-integrated programs leading to the Certificate of Advanced Mastery. The steering committee changed the vision and name to convey a focus of high quality education to high quality students. The steering committee did not want the Center to be viewed as a skills center or a vocational high school because the curriculum was intended to not only provide entry level job skills but also the ability to articulate into college or university curriculum. For example, one participant summed the fears of others:

I had a feeling that if this crew set the agenda or dominated, we were developing another SABIN Center. This was contrary to being the Center for Advanced Learning (Interviewee #4, February 6, 2002).

Further, the mission was articulated:

...to provide secondary East Multnomah County students with advanced, specially designed regional learning environments for a variety of career pathways, using contextualized learning

modalities in state-of-the-art technology applications that are aligned with state educational and national industry integrated standards (Schuette, 2000a, p. 1).

This mission statement remained constant and was used to support a February, 2000 Charter School application to the Oregon State Department of Education; however, the vision statement in that application changed significantly and stated:

Our vision is to significantly upgrade and extend, not supplant, district and articulated community college education programs and community partnerships, creating innovative, relevant, high-level education opportunities leading to advanced specializations in CAM endorsement areas (Schuette, 2000a, p. 3).

The partners identified at that point included Centennial, Gresham-Barlow, and Reynolds School Districts; Mt. Hood Community College; Multnomah Educational Service District; Boeing Portland; Quadrant Precision Manufacturing; Atlas CopCo Wagner; LSI Logic; Ketiv; Fujitsu; Walker Travel; Legacy Health System; Oregon Building Congress; and the Associated General Contractors. It was envisioned that the Center would open in September 2002 and provide a minimum of 500 students from four high schools with programs in information technology, medical health careers, and pre-engineering and manufacturing. Pre-engineering and manufacturing were originally two separate career pathways; however, the steering committee decided to combine them into one career pathway to expose students to two closely linked careers, thereby giving students greater opportunity and choice in exploring options while enrolled in one program. It was expected that in September 2003, hospitality and tourism and construction and

apprenticeship programs would be added to serve a total population of 700 students (Schuette, 2000a).

As the vision became clearer with time, the momentum it generated acted as a strange attractor for many. For example, two private sector representatives whose companies were potential partners indicated the importance and economy of scale of the project:

They knew this was the right thing to do, that regional settings for professional/technical education was a far better solution than trying to emulate each one of those programs in all the various high schools (Interviewee #9, February 12, 2002).

So I think the fascination of the project was that it would take kids different places while being the impetus for other business growth and expansion, and I think has tended to symbolize a vibrancy in the community that wouldn't exist without this program.... it was something new, something different, and it made sense economically (Interviewee #13, March 15, 2002).

From an educator's perspective, one superintendent indicated the reason for establishing the CAL was to do the right thing for students and he, like the private sector representatives, indicted the project provided an economy of scale for all partners. The potential in a project of this nature could have been for participants to protect turf rather than looking to regional solutions and opportunities for students:

...we just happened to have a group of folks who are more concerned about doing things for kids than protecting turf. We had the realization that if we could pull out [all] the stops as a group we can afford to do this project rather than trying to do it individually (Interviewee #6, January 16, 2002).

Two manufacturing companies who would later decide not to partner with the Center were initially very supportive of the project and indicated the value of the project to the region in maintaining a competitive edge. In a letter of support for the project, one company stated:

...we're looking forward to working with the Boeing Company, the City of Gresham and other local area manufacturing companies to aid in the building of the proposed training center. This could be a giant leap forward for the future of our industry (Spearman, 1998).

The other company indicated:

...we are very supportive of the local effort in the high schools, community college and through the Oregon Metals Council to cooperatively help address the needs we have in the development of the interests and skills of our young people in the metal trades... we feel a strong sense of responsibility to the community to share in the support, the training and the direction that the metal trades has taken to maintain our competitive edge (Bruce, Linhares, & Shepard, 1998).

The Boeing Company was very supportive and publicly stated "...[we] will be proposing the use of our own employees to be utilized as subject matter experts during the planning phase" (Mazzio, 1998).

The vision was compelling in bringing together the community, being politically defensible to the voters, providing an economy of scale, and potentially providing students with increased educational opportunities and career pathways. The initial vision was limiting by focusing on the delivery of manufacturing skills and abilities to meet industry technology demands, and it did not focus on developing articulation with higher education. As more potential partners

participated in the conversations about the Center, the vision changed to include economic considerations, individual perspectives, linkages to higher education, and workforce development considerations. The final published vision statement contained these essential elements and better articulated the benefits for students, employers, and the region by more clearly stating who the target audience is [high school junior and senior students], what was to be delivered [advanced, specially designed learning environments, using contextualized learning and state-of-the-art technology applications], how curriculum was to be delivered [aligned with state educational and national industry-integrated standards], and the purpose of the delivering an advanced curriculum [to increase the number of students pursuing advanced coursework that better prepares students for collegiate studies or other professional training programs]. The final vision articulated in the charter school application dated January 2001 states:

The Center seeks to provide high school junior and senior students with advanced, specially designed learning environments, using contextualized learning and state-of-the-art technology applications that are aligned with state educational and national industry-integrated standards. It seeks to increase the number of students pursuing advanced coursework that better prepares them for collegiate studies or other professional training programs (Gresham-Barlow School District, 2002).

Curriculum Development

Curriculum development was another key element that contributed to sustained development of this project. The curriculum development process was

frequently described by interviewees as frustrating, inefficient, and too lengthy a process. As a result of the interview coding process, curriculum development process was cross-referenced 13 times as a self-organizing effort, cross-referenced eight times as a source of feedback that continued to influence other parts of the project, and cross-referenced five times as a self-regulating process. In addition, curriculum development was cross-referenced 13 times with the project dynamics category, "efficiency," but described as an inefficient process.

After trying to initiate the curriculum development process using existing personnel assets in fall 1999, the steering committee determined that the scope of necessary curriculum development activity was beyond the expertise and time available of existing employees.

What didn't work well was believing we could invent this all with internal talents. By us going out and actually finding some expertise in the kind of curriculum that we wanted to develop, this was absolutely essential to the success of this project, and a person who did not have any preconceived notion about the politics, the players, or any of that stuff, but was more concerned with a curriculum development process, leads to a sound set of outcomes that made sense for the purposes of why this school would exist, and that gained us so much greater ability to move forward once we came up with that common agreement of what those outcomes looked like (Interviewee #1, January 8, 2002).

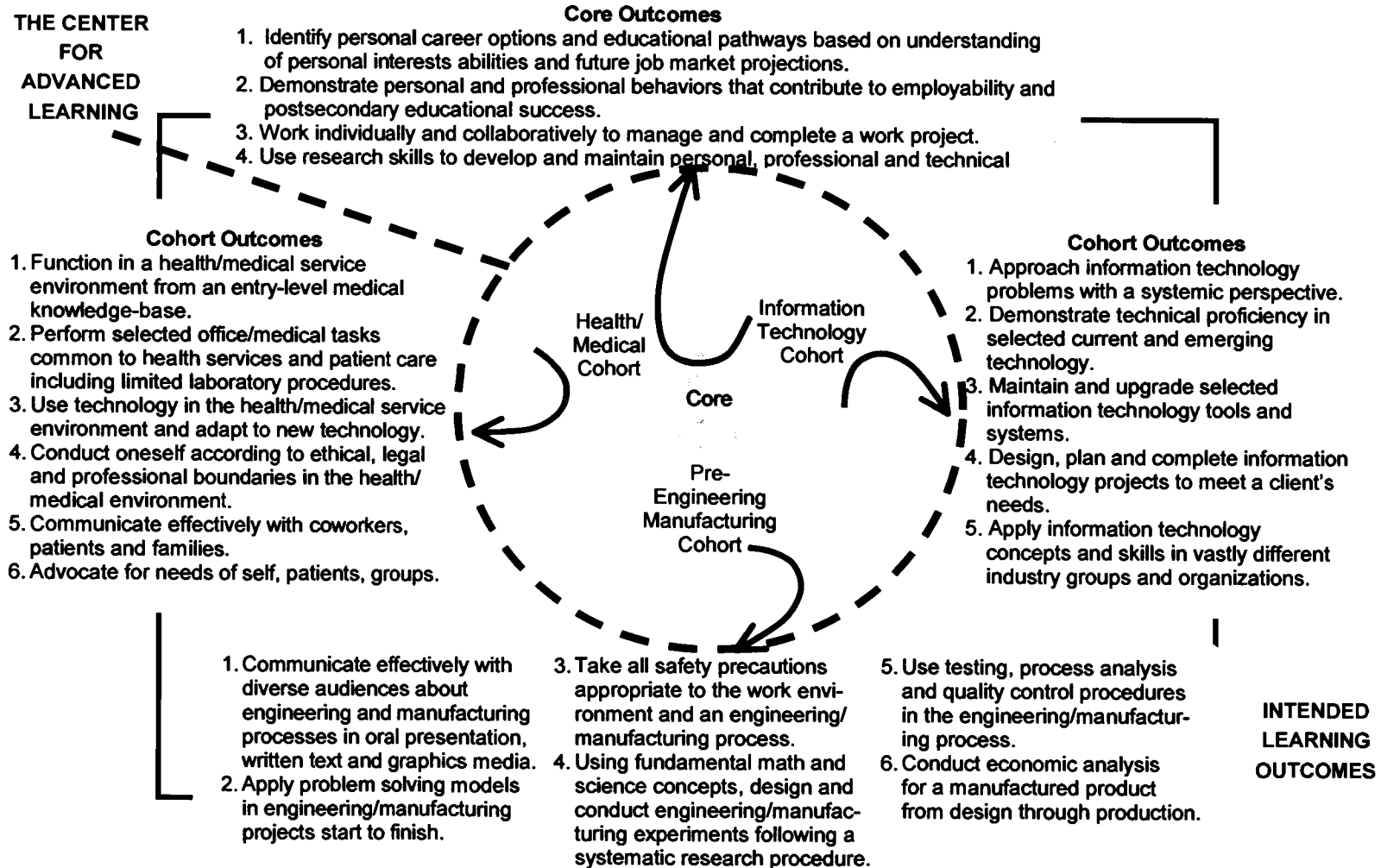
The steering committee contracted with a team of curriculum development specialists, who were employed as faculty at Oregon State University, to build capacity within faculty and private sector representatives who were unfamiliar with an outcomes-based curriculum development process. The capacity building was designed to give everyone a better understanding of outcomes-based curriculum

development processes and an understanding of the concept of integrated curriculum. The team also facilitated identifying the Center's core and career pathway specific outcomes. Figure 2 represents the CAL outcomes identified by the curriculum development team and agreed upon by the participants during the curriculum capacity building process.

Faculty and administrators representing health science, pre-engineering and manufacturing, and information technology disciplines from Mt. Hood Community College and participating high schools, representatives from industry, and faculty from universities were recruited into three curriculum development teams. Representatives from the four-year institutions that participated in the curriculum development process were from Portland State University, Oregon State University, Oregon Health Sciences University, and Oregon Institute of Technology. Those teams met monthly and were aligned with information technology, health sciences, and pre-engineering and manufacturing disciplines. Curriculum development was conducted as an open collaborative effort. Participants could join or leave the process at any point, which would lead to heightened levels of frustration for those who remained for the duration.

After the initial capacity-building for participants and identification of the core and discipline-specific outcomes, the curriculum development process was handed off to a faculty member from Mt. Hood Community College. That faculty member, with the assistance of the director of the MHREC, met regularly with the

Figure 2. CAL Outcomes



separate discipline-specific teams. That process—to develop a framework for the three curricula—continued for an additional year and a half.

Assumptions agreed upon by participants for the curriculum development process included: 1) the word “advanced” implies that students participating in one of the CAL cohorts will have an accelerated learning experience as it applies to their area of specialization; 2) it is expected that CAL students, upon graduation, will go on for further education or training either at the workplace, the community college, or the university; 3) as part of the curriculum planning process, a core set of intended learning outcomes for all CAL students will emerge; 4) none of the three specializations will be further subdivided by specific occupational roles; 5) the involvement of business and industry, community college faculty, and university faculty is critical to the development of a solid outcomes-driven curriculum; 6) it is essential that each of the specializations meets the directives associated with CAM; 7) outcomes-based curriculum models will be used in all curriculum planning and will emphasize student learning and assessment as the “bottom line”; and 8) the curriculum may or may not consist of courses as we have traditionally known them (Stiehl, 2001).

As part of the curriculum development process, recent high school graduates from the participating high schools were interviewed in focus groups and asked several probing questions regarding their experiences and expectations in high school and in the work place. It was important to the steering committee that student expectations were considered as part of the curriculum development

process and it was felt that without addressing their expectations the curriculum could potentially not meet the needs of those stakeholders or be as engaging as it could be. The focus groups indicated graduates of the CAL needed to be able to: 1) organize work projects, 2) write technical directions, 3) work with diverse people in a team environment, 4) be able to explain things clearly, 5) study effectively on their own, 6) articulate what they think, 7) show poise, and 8) assume responsibility (Stiehl, 2001).

When asked how they would improve their high school learning experiences they indicated: 1) hire teachers who want to coach and mentor, 2) lower the student to teacher ratio, 3) provide flexibility and fewer mandates, 4) connect with the real world, 5) have experiences that broaden rather than narrow their career interests, 6) obtain better career and educational advising, information, and awareness, 7) get more practical experience, and 8) "do it with friends." The students further indicated that what would attract them to the CAL is: 1) a new technology image, 2) real work application, 3) college credit options, 4) a jump start on career and college education, 5) more direction for career and education opportunities, and 6) a cooperative work experience (Stiehl, 2001).

While these focus groups provided insight and understanding of curriculum expectations the actual curriculum development effort was categorized as inefficient, while at the same time viewed as a free-flowing creative process. Half of the interviewees indicated curriculum development was inefficient and indicated they would have done things differently by limiting the number of participants and

their ability to freely enter and exit the process. "What was ineffective was that we had too many people" (Interviewee #4, February 6, 2002). Another participant reiterated the same sentiment, "I think being able to really pick a core group of people that would get the job done without wasting a lot of time would have been more efficient" (Interviewee #14, January 30, 2002). One private sector representative indicated:

The ineffective part of the process might possibly be that people involved with the educational end of things didn't understand or don't understand how a technical person has to be trained and move across a time period and are able to function more completely... I saw a lot of brainstorming that sometimes doesn't happen because the industry people get put into a box, and they don't have the freedom to be able to think more freely that way, more creatively. I think that's what the educational end of it has brought to the project (Interviewee #3, February 2, 2002).

...five of the outcomes for each of the three programs are identical. They are more of the SCANS or soft kind of skills, but it was interesting that independently, three different groups came up with the same outcomes, which I think really says to me that we are listening to what business says they need, because these were all done with business participation as well as educators' participation (Interviewee #7, March 7, 2002).

The curriculum development process continued from August 2000 through April 2002 and it proved to be labor intensive and created significant frustrations for educators as well as private sector representatives. Tensions mounted surrounding a desire to narrow the scope of the curriculum, trying to maintain a consistent group of participants, and readdressing previously covered ground as new participating members came into the picture. There was a sense that the group

was unwieldy and would have been more efficient as a smaller group. An alternative was suggested by one of the participants:

I think I would have [had] a panel of about four or five that were a critical part of deciding the curriculum and organization, review the input, and not have to worry, or not consider [that] you had to build consensus about everybody else and compromise too much (Interviewee #8, February 3, 2002).

Also, knowing that individuals who helped design the curriculum would not necessarily be the ones teaching it two years later caused questionable buy-in from faculty, and frustration for administrators.

I think one of the most difficult challenges we had was in inventing a school without having any employees of the school to help in development. Those individuals didn't exist; when you pull together people in curriculum development, there was not an assured stakeholder, because there was no notion of, 'Am I going to help deliver this, or am I just here to do some kind of service to this particular project.' So, it made it very difficult, without having groups that were going to actually carry it out, to try to wrestle with some of that decision-making (Interviewee #1, January 8, 2002).

Frustrations and criticisms by other curriculum development participants centered on concerns about high school faculty commitment and their willingness to develop an innovative outcomes-based curriculum:

...some of the high school faculty are notoriously resistant to anything but the status quo, especially if it means they might have to do some extra work. I think that's going to be the biggest problem and the biggest thing to overcome is preconceived notions of the faculty (Interviewee #14, January 30, 2002).

I would have tried to find more front-line people who had worked on and could quickly get a passion for the project. I don't believe we had a deep enough passion from the right people, the teachers.

I wish that it had been led by the faculty (Interviewee #5, February 18, 2002).

Another curriculum development concern, despite initial capacity-building training for participants, included creating a common understanding about what contextualized learning entailed.

One of the frustrations I have been working on with the school teams is trying to have everyone appreciate that this is a new type of learning institution. It is not just a translocation of current programs into a regional facility. Having that really understood and really appreciated, I think, has been frustrating. Because I think that people bring in sometimes their own current understanding and trying to replicate that in this facility, when I think the vision will only be realized if it is a step beyond the current. So I suppose that has been the toughest part in dealing with the one aspect of curriculum development that is trying to transcend current operation (Interviewee #6, January 16, 2002).

Description of the curriculum as outlined in the public charter school proposal indicates:

Curricula of the Center complements and expands the academic opportunities within the districts' high schools by offering advanced coursework in three areas of specialization... the curriculum and course offerings have been designed to engage each student in acquiring knowledge and skills consistent with Certificate of Advanced Mastery endorsement expectations as well as industry standards.... Emphasis is also placed on students acquiring soft skills, such as organization and communication skills, problem definition resolution skills, and learning associated with functioning productively in a team (Gresham-Barlow School District, 2002, p. 2).

The entire curriculum development process for all three curricular strands, including capacity building, defining the core and specific outcomes, and developing capstone projects, took approximately two years. The remaining year

before the CAL opens will be spent on faculty development and curriculum implementation.

Governance

A key characteristic in organization of living organisms is its hierarchical nature. There is a tendency to form multileveled structures of systems within systems. As system components interact with one another through choice, chance, and certainty, these newly networked parts undergo a metamorphosis. This emergence of order is the new condition or state created by the newly aligned pattern of connections (Capra, 1996; Pascale et al., 2000). Governance was cross-referenced seven times as a self-regulating process during the interview coding process. Governance was not viewed as efficient or inefficient, not something that should be done differently, or as a significant contributor to sustaining the developmental process.

The role of participants shifted over time from initial advocacy of the project, to engagement and recruitment of potential partners, to facilitators of structure and order. From initial self-organization activities emerged structure, order, and a governance scheme. At the beginning of the project the three initial organizers began advocating to regional educational leaders a collaborative solution to regional workforce development needs. As interest among educators in the concept increased, a series of exploratory meetings began in August 1998 and continued through June 1999. The purpose of the meetings was to examine how

regional education organizations, in collaboration with the private sector, might address the current and future work force development needs of the region. There was also increased interest by educators to identify regional private sector organizations willing to support and potentially partner on a project of this nature. Educators identified prospective private sector organizations, and representatives from those organizations were invited to more of the exploratory meetings. In September 1999 a steering committee was formed to identify tasks that needed to be accomplished and bring the project to fruition. Concurrently, the decision was made by the participating school superintendents to implement the project, and Mt. Hood Regional Education Consortium assumed coordination responsibility for the project while reporting to the steering committee. The role of the steering committee was then to provide an organizational structure to facilitate development of the project. During 2000 the steering committee initiated: 1) the charter planning grant award, 2) facilities planning, 3) curriculum development, and 4) coordinated school bond initiatives.

The role of the lead spokesperson at the first three meetings was to bring together educators and potential private sector partners to engage in conversations surrounding possibilities for development of a regional professional technical center. He stated:

My involvement at the beginning was to get these guys together and say this is a good idea. It just got better and better as people sat down and began to realize they had common interests... One [motivation] was we just happened to have a group of folks who are more concerned about doing things for kids than protecting

turf. We had the realization that if we could pull the stops as a group we can afford to do this project rather than trying to do it individually (Interviewee # 6, January 16, 2002).

Initial self-organization and regulation felt disjointed to many participants; they experienced discomfort with the absence of formal leadership or a governance structure. Participants frequently indicated they were looking for a preconceived plan rather than understanding they were creating a new organization with new purpose, function, and structure—one that had never before been attempted in the region. One early participant summarized what others were feeling:

The very first thing I would have done is...wherever there was committee work, or wherever there was discussion that was open to some kind of general forum, I would have had a co-chair, a business representative. One of the other things I have yet to see, and maybe it's there and I just haven't seen it, I don't know that anyone has a real plan. There's pieces of this that seem to just happen. Now, there must be some kind of a general plan with milestones and expectations and responsibilities, but I haven't seen it, and I think that that would help the project be more on target. People would know who is accountable for what activity (Interviewee #9, February 12, 2002).

Another interviewee indicated the importance of identifying leaders and preparing them for success:

I would identify who those key leaders are early on in the game and really set them up for success, and taking the time to strategically think about...to think about who are the key stakeholders, how are they going to interact, how are you going to communicate with them, what's your investment in the people you're asking to invest in the process, and don't let go of them (Interviewee #10, February 11, 2002).

Five interviewees suggest there should have been a master plan or that there should have been a formal leader—but there wasn't. The sense of confusion was created

through self-organization as ideas were continually being generated and plans adjusted. There was no apparent evidence in interviews or observation to suggest that turf issues or egos were influencing project decision-making.

In October 1999, the director of the Mt. Hood Regional Education Consortium began facilitating conversations with stakeholders and participants in an effort to establish an orderly CAL developmental process and to maintain the momentum. Bill Lesh perceived his role was to facilitate the development of outcomes and coordinate the conversations, but not on a linear predetermined path. The path emerged from discussions and open conversations. Consensus among the steering committee representatives and stakeholders was important in the decision making process. Consensus was defined as general agreement among participants. From Lesh's perspective:

I think the major role that I play is the facilitator of the set of outcomes that all the partners want, assisting in convening meetings around a steering committee, which I'm a member of, as well as curriculum development across all the program areas that we've chosen, and to be able to deal with the logistics of bringing all these folks together to make some decision making happen. I also played an active role in working with the elected officials to try and help them understand what we were trying to accomplish, so that they could be advocates of the program, also, and that has taken quite a bit of time (Interview with Bill Lesh, January 9, 2002).

The dynamics were such that the vision created a collaborative environment in which leadership and ownership was shared informally:

I think in the governance area, there was no dominant leader. There was a shared vision and a shared ownership of what happens and no one individual or one group of folks was driving the train at

the expense of the other players in the group. Now, that doesn't always happen when we have leadership dynamics, especially in the area of people who have the role of superintendent.... It's because they intentionally said that these things are important enough to us that we'll give up a little bit of our own concerns over here, because this is the greater good for the group of students that we have (Interviewee #1, January 8, 2002).

The steering committee, established in mid-1999, divided workload responsibilities. The steering committee was comprised of one assistant superintendent from each school district and the director of the Mt. Hood Regional Education Consortium. Each assumed responsibility for one or more of the following components of the project: 1) governance, 2) resource development, 3) facilities development, 4) managing partnerships, and 5) curriculum development, while collectively they assumed responsibility for the vision. "We have, as members, divided responsibilities for certain things, so each one of the assistant superintendents, for example, chose a different aspect of the program to represent and concentrate on..." (Interviewee #13, March 15, 2002).

The individual responsible for governance was focused on developing a structure that would allow the relationships that existed, and potentially would be developed, to provide maximum flexibility and maintain a high level of trust and collaboration with the least level of formal agreements. The curriculum development individual was responsible for: 1) recruiting education and private sector participants, 2) imbuing an understanding of outcomes-based education, 3) identifying core and discipline specific outcomes, 4) creating the documentation, 5) developing capstone projects, and 6) coordinating faculty and student learning

opportunities. The resource development individual was responsible for: 1) identifying grant opportunities, 2) developing projections and budgets, 3) identifying potential equipment and instructional media donation opportunities, and 4) coordinating bond initiatives. The logistics individual was responsible for: 1) coordinating and sorting out school schedules and related transportation issues, 2) identifying facility management issues, and 3) forecasting student demand. The facilities individual was responsible for: 1) managing the design, 2) acquisition development, and 3) construction processes.

The steering committee met weekly beginning in early 1999 and currently continues to meet, which represents a significant level of commitment by each school district. "We have... probably met, I would say on the average, almost once a week for the last two years" (Interviewee #13, March 15, 2002). Another steering committee member indicated they were the key decision-making body:

We've been the decision makers as far as what we'll do next. We're the ones who made the decision to hire the curriculum development team. We're the ones who made the decision on who to invite and how to organize and operate to gather the input, we're the ones who scheduled most of the meetings, and all of us attend as many of those as we can. We're the ones who continue to come back to our own districts and communicate with our superintendents and our school boards to keep them on board with what is going on. Pretty much, I think we have been the driving force as far as, I hate to say day-to-day, because it isn't that often, but the week-to-week movement of the program (Interviewee #7, March 7, 2002).

The Center was tentatively named the East County Advanced Training Center in early 1999 to differentiate it from the greater Portland metropolitan area. The

initial vision for governance of the East County Advanced Training Center had a three-level structure. At the top was the superintendent's council comprised of the superintendent from each of the school districts, which was to be overseen by the local school board and Mt. Hood Community College Board of Education. The second level was the Center director and the host district fiscal agent. At the operational level there was the Center staff, programming advisory committees made up of industry representatives, and other agency support personnel. Figure 3 depicts this early governance structure.

The steering committee determined that the governance structure would be community-based. Because the Center was to be established as a charter school, it needed a separate board. Unlike the initially proposed governance chart depicted in Figure 3, the Center would need to establish a separate seven-member board that included one representative from the founding school districts and Mt. Hood Community College, while the remaining two appointees would come from the business community. The charter indicates the board may have up to 13 directors. It is envisioned the CAL Board may expand in the future as the need arises. Board members will serve for a period of three years; however, the terms will be staggered so not to expire within the same year. Similar to the originally envisioned structure, advisory committees were maintained for each program. Figure 4 represents this new governance structure.

Figure 3. East County Advanced Training Center
(CAL Steering Committee, 1999a)

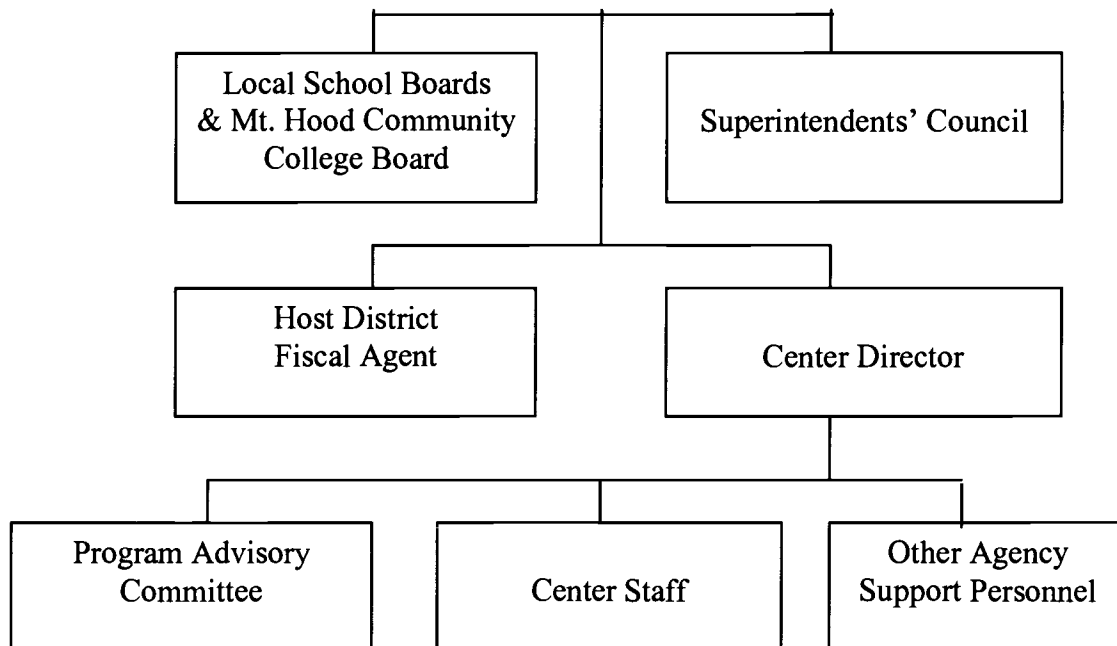
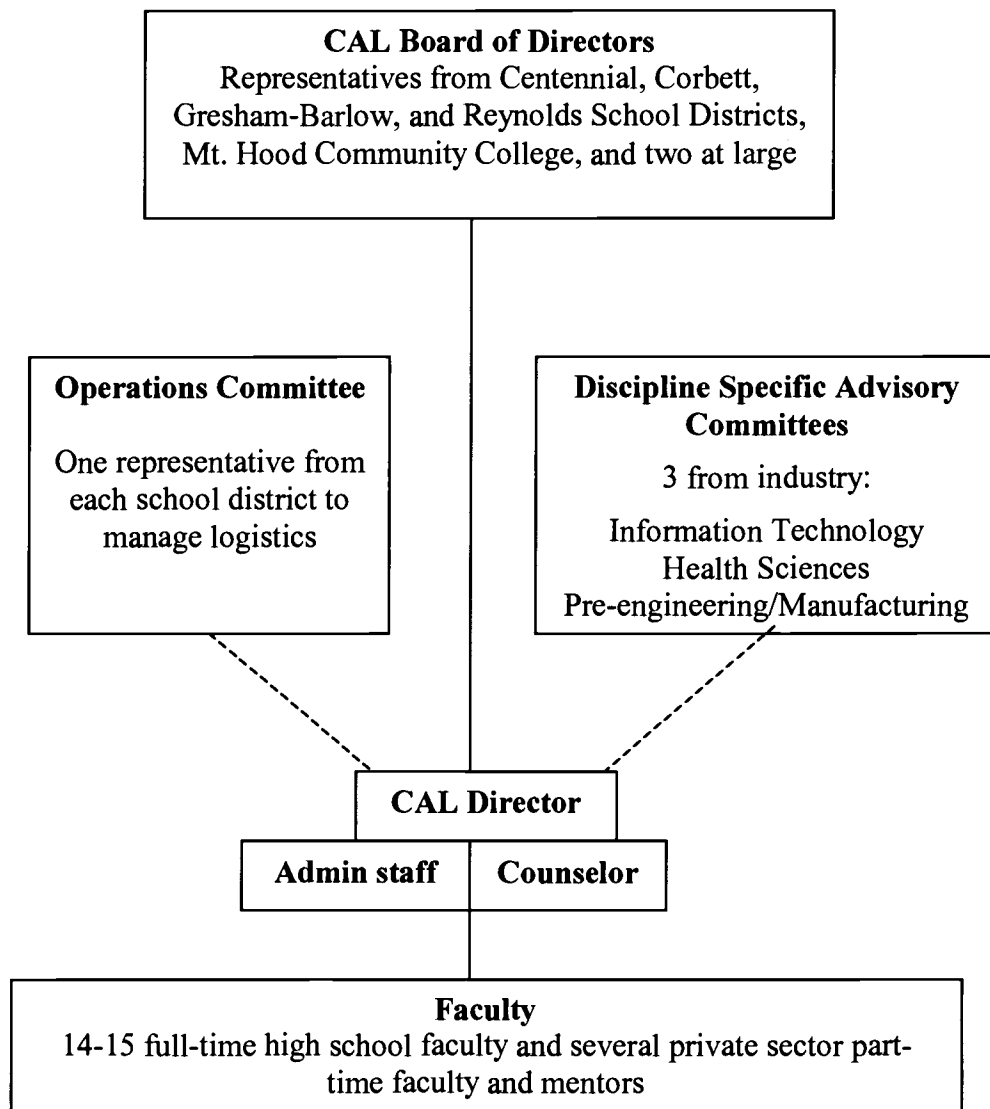


Figure 4. Final CAL Governance Structure

The steering committee, comprised of the Center director and an administrative representative from each high school, will remain intact as an operations committee and will be responsible for developing procedures to address logistical, scheduling, transportation, and budgeting issues. The committee will also continue to maintain linkages with high school administrators and business managers about operational details. The Center Director will report directly to the Center for Advanced Learning Board. Intentionally, the organizational structure is designed to be flat with three levels: 1) the governing board, 2) the director, and 3) faculty. This structure was intended to encourage more direct and less circuitous communications (Lesh, 2001).

Final CAL Governance Structure

A major role of the steering committee was to determine what the formalized agreements would be that would govern the acquisition, development, and management of the CAL facility and mitigate future liability exposure for the partners. The major governance issues that needed to be addressed in a formal written agreement were: 1) site and facility ownership, 2) employee status, 3) waivers from the State Board, 4) operational expenditures, and 5) program integration with high schools (Lesh, 2001). To formalize educational partner roles and responsibilities, a complex intergovernmental agreement was crafted which was required to be addressed in the charter school application.

In the governance area, we put together an intergovernmental agreement that allowed the districts to work together with the college, business, and industry, and operate this as a whole separate charter schooling notion (Interviewee #1, January 8, 2002).

A model intergovernmental agreement that would address this level of complexity for financial contribution, facility acquisition and operation, and governance structure was not to be found. The educational partners developed four intergovernmental agreements for CAL acquisition and operations that were presented to individual school boards for approval in February 2002.

We have not seen one, in terms of a regional center or even a professional/technical center, that was operated by an intergovernmental arrangement, where we had four partners, three districts and a college, coming together actually to operate a center. I think the reason it's not done indicates that there is a level of complexity here that's not often addressed satisfactorily (Interviewee #13, March 15, 2002).

An intergovernmental property agreement between Reynolds, Gresham-Barlow, and Centennial school districts outlining the intent of the partners to jointly contribute and operate the Center addressed the following issues: 1) capital contributions and percentage ownership, 2) payment of operating costs, 3) property management, 4) contracting authority, 5) insurance, 6) fiscal obligations, and 7) dispute resolution. More specifically, this agreement addressed: 1) project design and management, 2) design review process, 3) site plan approvals, 4) site work construction plans, 5) construction responsibilities, 6) allocation of payment of costs, 7) construction easements and condominium conversion, 8) insurance and indemnity, 9) dispute resolution, and 10) financing.

A Condominium Purchase Sale Agreement was developed to convert the property facility into a condominium-management model to facilitate joint ownership and management. A third agreement articulating the condominium owner responsibilities included provisions for: 1) common profits and expenses, 2) voting rights, 3) use of the property, 4) maintenance of elements, 5) easements, 6) association of unit owners, 7) right to expand, and 8) severability.

A fourth intergovernmental agreement is the Bylaws of the Association of the Unit Owners of the Center for Advanced Learning. This agreement addresses: 1) meetings of the association, 2) the Board of Directors and officer responsibilities, 3) budgets, expenses, and assessments, 4) records and audits, 5) maintenance and use of condominium property, and 6) insurance and liability (CAL Steering Committee, 2002a). The complexity and importance of these agreements is summed by a steering committee member:

We helped formulate the agreements. The charter school application forced the issue. It consisted of having a charter school plan, leading to policy and describing the entire operation, just as if you were a separate entity coming in and wanting to open a [new] school. So we needed to address a lot of those governance issues just to create the charter application – so that really helped (Interviewee #13, March 15, 2002).

Two other formal documents required for the establishment of the Center governance structure were the Bylaws (found in Appendix E) and the Articles of Incorporation (found in Appendix F). The Bylaws outlined: 1) purposes and powers of the Center, 2) restrictions to private gain, lobbying, and activities outside the purview of a 501[c][3] organization, 3) the role of the Board of Directors, 4) the

manner in which meetings of the Board of Directors will be managed, 5) who the officers of the Corporation are, 6) how committees are to be managed, and 7) miscellaneous provisions relating to the execution of official instruments and record-keeping (CAL Steering Committee, 2002b).

The Articles of Incorporation for the Center for Advanced Learning, in addition to several of the components outlined in the Bylaws, also included provisions for dissolution and the limits of liability for the director and uncompensated officers of the corporation. The school boards approved the formal intergovernmental agreements in March 2002 (CAL Steering Committee, 2002c).

It has been suggested that, if possible, the entire project as well as the governance structure should have been committed to in writing earlier on in the process; however, out of respect for the collaborative nature of the project and partners it was determined more important to maintain the buy-in and momentum along the way, rather than trying to maintain adherence to a strict time schedule:

I think if we could have done governance in writing a little earlier, we probably would have gotten to logistics a little sooner. I think the difficulty was, in a group project like this, it's harder to hold accountable for the players that need to move things forward, because you don't want to feel like you're the one driving the train at the expense of other people, and negotiations with the city, and negotiations with the developer, it's always sensitive that if one district is taking all the time and energy to do that, are we caring for the collective group shared vision? So, that was a real precarious kind of time. We wanted to move the project forward, but we wanted to move it forward with everybody providing leverage to do that, not just a single entity (Interviewee #1, January 8, 2002).

As the project progressed, the need became apparent to transfer from a volunteer workforce to more full-time management and administration of the Center. In August 2002, a half-time CAL director position was established to guide the final stages of construction and program implementation during the last year, prior to opening in April 2003, with classes beginning in September 2003. The CAL Board and governance structure was formally implemented in August 2002 as well.

The governance structure emerged through self-organization and self-regulation. Early meetings were organized by a group of interested individuals with no appointed or emergent leader:

So the four or five of us would get together before these morning meetings to develop a tight agenda and it was really the initial thinking group for this project (Interviewee #2, January 9, 2002).

As the project began to evolve and gain structure, several of the participants indicated a level of discomfort with self-organization and self-regulation. For example, when one of the three initial organizers left the project, one participant suggested discomfort with the lack of organization:

...she was a consultant, not a leader, so when she left, it kind of pulled everything out, we had several staff people keeping the vision alive but we had no leadership, per se, and organization was missing. We had to organize ourselves (Interviewee #10, February 11, 2002).

Another described the developing governance structure in terms of a living system:

...we are talking about a project that involves different entities, different districts, different partners, it's one that has to evolve. It has to grow, it has to germinate. You're never sure about what the cell division is going to be, and what little organism is coming next, but I'm not sure we could have done anything differently in terms of the developmental process (Interviewee #13, March 15, 2002).

When asked what could have been done differently in terms of project organization, one interviewee summed what others had indicated:

So, I think what we would do differently is, we would probably have created the timeline for decision making. I think that we should have done the governance piece first (Interviewee #1, January 8, 2002).

Development of an effective governance structure evolved to a point that the steering committee and superintendents, without aid of attorneys, initially developed the informal and formal governance structure and agreements. Through a circular, iterative, and evolutionary process, the purpose, function, processes, and structure were continually redefined, each continually influencing the other.

Contributing to development of the governance structure was the educational reform movement. Education reform and the prospect of creating a new entity that could better and more efficiently serve the regional educational needs became a powerful strange attractor. Recent literature on educational partnerships indicates there is a movement at the local, regional, and national levels to connect education, the world of work, and governmental agencies (Business Coalition for Educational Reform, 2001; Business-Higher Education Forum, 2001; Elsner, 2001; Lankard, 1995; Workforce Learning Strategies, 2000).

With the passage of Senate Bill 100 and House Bill 2550 on May 27, 1999, Oregon became the 38th state to allow charter schools. The legislation permits only a local school board or the state Board of Education to sponsor a public charter school. The application process to establish a charter school is lengthy, requiring at least 120 days for public hearings, modifications, and judicial review (Oregon School Boards Association, 1999). The CAL steering committee believed the advantage of establishing the CAL as a charter school was to provide an opportunity for up to 50% of the instruction to be conducted by industry representatives without requiring a lengthy teacher certification process.

To provide an incentive for organizations to pursue charter school applications, the State established an Oregon Public Charter School Incentive Grant Program in fall 1999 (Oregon Department of Education, 1999b). CAL submitted application and received incremental charter incentive implementation grants totaling \$320,000 to support planning and implementation for the CAL. When asked about the advantages of establishing the CAL as a charter school, one assistant superintendent articulated:

One, we can get some money out of the state in charter school grants, and that was very attractive to us for startup situations, but that wasn't the only reason. If it were the only reason, I don't think we would have moved forward. The other reason is because we could get some things waived that, as districts in K-12, we couldn't have gotten waived any other way. The charter allows us to have up to 50% of the staff come from business and industry. The charter allows us to run some different schedules and things it is really difficult to run in your home high school. The charter allows us the flexibility to bring in kids from other districts if there are slots available and have a formula to have that district pay for

those slots, and it's automatic in a charter school, where in any other kind of situation, you have to sit down and individually negotiate that with other districts. So, the charter gives us the freedom to do that (Interviewee #7, March 7, 2002).

The charter school application was submitted to the Oregon State Department of Education in January 2001.

CAL was ideally positioned to implement Oregon State CAM requirements for three of the seven career pathways identified by the Oregon Department of Education. CAM design also required more involvement of each student in developing a customized learning plan. Students were now required to be actively engaged in their educational planning to match personal, career, and academic interests. Students were also required, as part of the educational planning, to integrate application of academic and career-related knowledge and skills appropriate to personal and career interests and post-high school educational goals. The emphasis for career learning frameworks is that schools must implement and match learning opportunities to those students' interests and goals (Oregon Department of Education, 2001c).

To assist schools in implementing CAM, the Oregon Department of Education, Office of Professional Technical Education, developed CAM implementation criteria. Implementation framework for the CAM requires the following central components: 1) academic content standards, 2) assessments, 3) career-related learning experiences, 4) postsecondary connections, 5) career-related learning standards, 6) endorsement areas of study, 7) comprehensive school

counseling and career development, and 8) community partnerships. These components formed the underpinnings for the 12 CAM implementation criteria, as shown in Table 13 (Oregon Department of Education, 1999c).

Implementation of the CAM provides additional Early Collegiate Opportunities (ECO) for advanced students. ECO allows the student to take

Table 13. CAM Implementation Criteria

Criterion	Implementation criteria
1	Student learning and achievement are the emphasis of staff development and CIM-CAM planning.
2	Academic and career-related learning standards are achieved through integrated learning.
3	Curriculum opportunities are provided for all students to focus their studies within the context of an endorsement area (career pathway).
4	Career-related learning experiences reinforce classroom learning and contribute to student attainment of the academic and career-related learning standards.
5	Students receive assistance in the development of their education and career goals and transition to post-high school "next steps."
6	A joint planning process with next step partners provides connections to students' CAM programs.
7	Community-based learning opportunities for students and teachers are provided through collaborative community partnerships.
8	All students are ensured access, necessary accommodation, and modification to CIM-CAM opportunities through collaboration of school staff and relevant external stakeholders.
9	Student achievement and overall school performance are measured by the school and community for continuous improvement.
10	Administrators support and provide leadership for CIM-CAM implementation.
11	School staff members are committed to school improvement implementation.
12	Students' learning goals determined resource allocations.

college-level courses and receive college credit at their high schools. The ECO courses must meet the same standards as the college course, the college must approve them, students must meet prerequisite requirements, and the instructors at the high school must meet college level instructor qualifications. Typically, less than the top 10 percent of high school students take courses for college credit. Many of the courses taught at the CAL will be offered as Mt. Hood Community College credit courses.

In school year 2002-2003, ten Oregon high schools have been selected to pilot test the CAM prior to mandated statewide implementation in 2004. Reynolds High School will pilot CAM for the region. The learning of how to effectively implement CAM by Reynolds High School will be directly transferable to the CAL. In other words, it provides CAL a jump-start for implementation as they begin initial operations for school year 2003-2004. Changes to the state guidelines will allow schools to locally assess CAM effectiveness and use student proficiency attainment as the standard, rather than accumulation of clock hours.

To gain a better understanding of other innovative educational reform initiatives, the steering committee visited several sites throughout the country. Those included Francis Tuttle Institute in Oklahoma City; Peoria Community College and their Caterpillar partner in Peoria, Illinois; California Technical Training Consortium in San Jose, California; and five skills centers in Washington State. Although each had unique components of educational reform, none appeared to be comprehensive enough to match the vision that had been created for the CAL.

These organizations offered certificates and/or Associates degrees but were not connected to both the world of work and other higher education opportunities. Additionally, the steering committee visited CORD (Center for Occupational Research and Development) in Waco, Texas to gain a better understanding of where readily accessible technical education curriculum was being implemented nationwide. One discovery that would later have positive resource development implications was the impact of implementation of national skill standards with the private sector.

Partnerships

The strongest relationship among the six key CAL components existed between vision and partnerships. That relationship was established through coding and analysis of interviews. Nine interviewees referenced the importance of vision in keeping partners engaged. The second strongest relationship existed between curriculum development and partnerships, with five references.

Partnerships for the CAL can be classified as education-education, education-private sector, or education-government. Engagement of potential partners began in a traditional manner by trying to create interest with a comprehensive vision. Potential private-sector partners were recruited and courted; however, they did not reach closure by the signing of formal agreements. The only partnerships that resulted in formalized written agreements were the education-education agreements that were required for the charter school application and the

acquisition, financing, planning, construction, management, and maintenance of the facility.

Education partners recognized there were benefits to be gained by creating advanced learning opportunities for students through an economy of scale. Combining resources to develop the CAL and deliver its programs, which would have been too costly for a single school district to develop and deliver, created that economy of scale. In addition to creating an economy of scale, the partners were connecting advanced learning opportunities to the world of work and higher education while at the same time serving the community workforce development needs.

Not all school districts in the region participated, as there was skepticism regarding project risks, benefits, and required commitments. Political considerations were also an impediment to some districts' willingness to participate during the initial stages of CAL development. In a memo to his colleagues, one superintendent indicated,

I talked with [a superintendent] this afternoon encouraging his continued collaboration/partnership on the Center for Advanced Learning. I indicated it would be a shame if his students were not eligible because of stepping back from the project. The concept of a regional center is also helpful to attracting resources and argues for this district's continued participation. He wants to be careful in not communicating to his own community they have resources for the Center at this time, he said he'd like to continue to support the Center to keep such options alive. I indicated we would invite further conversations with him. We may need to push a little harder on keeping the communication channels active and seek his support for the next immediate steps (Buck, 2000, p. 1).

There was a sense by some school districts to wait until the project was a little further along prior to committing, which created a low level of anxiety for those already participating:

It could be the same reasons some of the other school districts aren't involved. The sons of bitches are saying "I don't want to be involved from the outset because it sounds like pie in the sky to me." They wait until we're down the road a little bit and everything looks good and then they wanted to jump in.... They don't want to jump in and take a risk first (Interviewee #6, January 16, 2002).

Although some of the districts philosophically saw the merits of CAL, concerns were articulated in May 2000 in a letter from Centennial School District to the CAL steering committee. Their concerns were: 1) there was no consensus concerning the operational costs, 2) a lack of understanding of the relationship between CAL staff and their districts, who supervises and evaluates part-time staff, and which district's salary and benefits schedule would be adopted, 3) insufficient information to do an analysis of the impact of CAL to present high school programs and personnel, 4) what contributions beyond ADMw were other districts contemplating [ADMw is the average daily maintenance weighted allowance districts receive as reimbursement from the state, and is based on student attendance], 5) the physical presence and commitment of business in the venture was unspecified, and 6) the proposed learning paradigm was drifting away from contextualized learning (Robinson, 2000).

The first formal document cementing the expected partnerships between the school districts was an educational agency partnership agreement dated February,

2000 which stated, "The superintendents of the Centennial school district, Gresham Barlow school district, and Reynolds school district have agreed to partner in the design and operation of the Center for Advanced Learning" (Schuette, 2000b, p. 1).

The president at Mt. Hood Community College, Dr. Joel Vela, indicated he was, "...supportive of educational reform and innovation that successfully results in students achieving higher academic standards." He went on to indicate he was pleased that:

...the initial vision for the Center captured a concept that included not only the needs of high school students, but adult training opportunities as well... and the collaborative nature of the project would result in the design of programs that responded to the changing economy and job market in the region (Vela, 2000, p. 1).

The education-private sector partnerships began as a call to the private sector to participate in the curriculum development of the CAL, while the private sector participants were looking to create a better-trained workforce. Partners were free to come and go and participate on an as-desired basis. Potential partners could enter the conversations at any point, as well as leave at any point without prejudice. Several potential partners engaged in the initial conversations and remained with the project, while others, for a variety of reasons, did not persist.

There were several motivations articulated by the private sector partners regarding their willingness to participate. In February 2000, Ketiv Technologies indicated that they believed the CAL would be a stimulus for economic development and would "strengthen the capacity within the community to attract other industry and commercial ventures" (DiVincenzo, 2000, p. 1). Representa-

tives from the City of Gresham economic development team also viewed the project as an attractor for potential businesses desiring to relocate to east Multnomah County. The City served as a connector between the CAL steering committee and the economic developer who ultimately supplied the land for the project. The land selected is centrally located in Gresham, adjacent to the metro rail transit system, a new shopping district, City Hall, and the Gresham-Barlow school district offices.

Partner expectations varied depending on the needs and type of organization. Table 14 summarizes those expectations.

The desired range of opportunities from educators' perspective for private-sector participation included: 1) sponsorship of laboratories; 2) generate cash; 3) provide equipment; 4) obtain hardware or software to support academic programs; 5) provide personnel to assist in the curriculum development process, teach, or provide technical support; 6) provide internship opportunities for students; 7) create job exchange programs for faculty; 8) sponsor professional development opportunities for faculty; 9) sponsor student scholarship opportunities; and 10) fund the construction of a teaching laboratory or a portion of the CAL facility (Buck, 2001b).

Table 14. Partner Expectations

Expectations	
<u>Private sector</u>	
Better trained workforce	<p>They were looking to try to find a way to get some accelerated training, or something focused in accelerated training in the technologies back in the secondary level versus having to wait for the two-year colleges (Interviewee #8, February 3, 2002).</p> <p>There was a strong need to try to develop a local workforce, especially in some high-end positions around some local companies that really felt like they had to go out way beyond this county to find employees that met their needs so those combinations of the K-12 educational programs not having what we wanted to have, and industry not getting what they wanted – a pipeline of students for their programs (Interviewee #1, January 8, 2002).</p>
Economy of scale	<p>The desire to consolidate the requests they were receiving from all the schools for support. It was more an economy of scale so they were not piecemealed with requests for support from competitors or other things from year to year. That was definitely an informal objective they had (Interviewee #2, January 9, 2002).</p>
Community service	<p>Legacy Health System is very interested in providing for an educated workforce, and that's why we have supported the Health Science Academy students coming in and having clinical time here.... one of their main focuses has been, since the beginning, helping children.... I believe the last figure I heard was over 400 high school students during the first two years, and then another thing that happened here in the East county was that some schools, I mean for like a community health nurse to work with the schools, so Legacy started funding that a year ago, I believe. That really is the main gist or thrust of the use of those committee funds is for children (Interviewee #12, March 16, 2002).</p>

Table 14. Continued.

<u>Education</u>	
Economy of scale	<p>We were talking about trying to improve the environments in the local high schools. And the problem then, as it has always been, is budget, and in order to run a shop class, there was never enough money (Interviewee #5, February 18, 2002).</p> <p>Regional settings for professional/technical education was a far better solution than trying to emulate each one of those programs in all the various high schools (Interviewee #9, February 12, 2002).</p>
Improved environment	We were talking about trying to improve the environments in the local high schools (Interviewee #9, February 12, 2002).
Improved educational opportunities	It provided a continuum of opportunity for students (Interviewee #1, January 8, 2002).
<u>Government</u>	
Economic development	<p>It would take kids different places with impetus for other business growth and expansion, and I think has tended to symbolize a vibrancy in the community that wouldn't exist without this program.... it was something new, something different, and the fact that it made sense economically (Interviewee #13, March 15, 2002).</p> <p>The data on occupational trends was so strong that the areas that we chose resonated with leaders in business and the city government, the college, in terms of good articulation with their programs, and I think with the high schools, in terms of where they were facing either program cutbacks or inability to provide facilities, so I think one is that the programs made sense (Interviewee #13, March 15, 2002).</p>

Although cash contributions were not forthcoming from the private sector, their support came in the form of: 1) personnel resources for the curriculum development process, 2) expertise for selection of equipment and instructional media and the design of laboratories, 4) development of capstone projects, 5) faculty development and student internship opportunities, and 6) donated equipment. The lack of cash contributions and no long-term commitment created frustration for the educator who perceived a lack of commitment from the private sector:

We would love to do something more formal [from the private sector] but, once again, that's a two-way street, and I'm not sure they want to do that. We're going to be satisfied with whatever we can get, but it would be really nice to have three-year commitments or five-year commitments of *something* from these companies, and I leave the *something* kind of open-ended, but it might be for the next three years, we'll have somebody mentor kids for four hours a week on their projects, or we'll have somebody who comes in and teaches this particular course for you and mentors your teachers to get them get ready to do this, or it might be that every year, we'll help you with the equipment purchases you'll need by giving you X amount of dollars to do that for a particular area (Interviewee #7, March 7, 2002).

Getting business involved was absolutely frustrating. They were supportive on the phone but the consistency of who was attending [meetings], always understanding the vision of the project and being able to move quickly... but they couldn't always move as quickly as they said they could (Interviewee #2, January 9, 2002).

The initial list of private-sector partners included Boeing Portland, QMP Aerospace, Atlas-CopCo Wagner, LSI Logic, Ketiv Technology, Fijitsu Microelectronics, Legacy Health System, and Oregon Building Congress (CAL Steering Committee, 1999b).

Private sector partners chose to commit to the project for a variety of reasons, but primarily from workforce development needs and a desire to be good community citizens:

I think we chose to partner with the CAL project because, one reason was probably selfish, in that we were looking at the CAL as a potential tool for recruitment... so that we can actually put out a higher quality or better educated person to go into the workforce, or to go on to a four-year institution where they can complete a Baccalaureate or Master's or whatever their academic endeavors are. From that standpoint, I think partnering with CAL makes a lot of sense (Interviewee #11, January 7, 2002).

Legacy [Health System] is involved in [CAL] because they know what they need is highly prepared health service workers. The same is true for Boeing, LSI, and Intel (Interviewee #6, January 16, 2002).

Legacy Health System is very interested in providing for an educated workforce, and that's why we have supported the Health Science Academy students coming in and having clinical time here.... one of their main focuses has been, since the beginning, helping children... (Interviewee #12, March 16, 2002).

Once we started forming some more nucleus partnerships that revolved around the site, it started becoming very apparent to us what this could do for our community and job attraction, and so that's when we started really ensuring that we were a part of the process and participating more actively in it (Interviewee #10, February 11, 2002).

There were also a variety of reasons why potential private sector partners chose not to affiliate with the CAL—primarily economic. There was concern over what the CAL would be asking of them, and with the downturn in the economy which began in 1999, companies were less concerned about the future quality and source of the workforce than they were about surviving and remaining viable in the

marketplace. One potential partner laid off 300 workers and another, a major microelectronics manufacturing company, closed their facility, which was less than ten years old, laying off 600 workers. "I think the downturn in the economy over the last year and a half that has impacted Oregon has been detrimental to business and industry partnerships" (Interviewee #11, January 7, 2002). Also, educators wondered whether or not the private sector had been lobbied enough:

I think there was not enough involvement requested by the business community. I think maybe we misunderstood what our role needed to be.... So, I think that we lose that audience, because there isn't enough for the them to do and keep them engaged. They don't want to just keep attending meeting after meeting without seeing the light at the end of the tunnel (Interviewee #9, February 12, 2002).

Until they [business] actually see that districts have passed bond measures, that all three of them have committed dollars, I think up until then, it was probably still just an educational fancy, and everyone was sort of uncertain about what it was actually going to do (Interviewee #13, March 15, 2002).

Boeing has trained high school kids in summers, and they have bought into this kind of training, which I think is good, but a lot of companies haven't. For instance, my company hasn't, and I'm not sure they would invest the money or the time to be able to help out there. By being involved in a program like this, the company could help students as well as their manufacturing capabilities by having the students work in the plant. Again, it's going to be an investment (Interviewee #3, February 15, 2002).

The time commitment, definitely.... that would be one [reason why companies were reluctant to participate]. The other would be, in these projects like this you realize that because you're a part of the community, you're going to get the benefit in the end, anyway, so you're hoping that what they happen to come up with is going to be advantageous to you. It's kind of like, you trust what the group is doing, but you don't necessarily see the need to participate, 'cause you're going to end up being able to access

and utilize the benefit that comes from the project, anyway (Interviewee #15, April 18, 2002).

Initially, educators were in a quandary regarding why the private sector was not more forthcoming with resources. The private sector is reluctant to commit valuable organizational resources, whether personnel time, funding, or equipment, to a new venture that does not have a track record of success and may be perceived as an unwarranted risk.

I wouldn't mind maybe having a little more resource commitment, and I'm talking about dollar resource commitment, from some of the bigger companies out here, as they're pushing us to get this done, and they're right behind us, but they haven't said, 'Well, let us help you by writing you a check to get some of this equipment'.... So, it would have been nice maybe up front, having them be more of a partner than telling us what they would like us to do. I would have liked to have them be a partner by signing on to some of the resource needs at the same time (Interviewee #7, March 7, 2002).

Acquisition of developmental resource from the private sector was scarce in the short-term. Over time the steering committee began to understand that partnership building and resource development with the private sector was a long-term strategy that required establishing mutually beneficial levels of trust and confidence. Building that level of trust and confidence was summarized by one administrator: "Our conversations were always upfront and out in the open even on the tough issues and things we didn't agree on. There were no sidebar conversations or deals cut in the hallways" (Interviewee #1, January 8, 2002).

Resource Development

Three types of funding were needed to bring this project to fruition: 1) startup funding to cover the costs of curriculum development, travel, and coordination; 2) facility acquisition funding to cover the costs of leasing, renovation, design, acquisition or construction and equipping a new facility; and 3) operational funding to cover expenses once CAL opened. Educators had expected the legislature and/or the private sector to provide the bulk of those funds. Funding for start-up was eventually provided through charter school incentive grants and operational funding was provided through state average daily maintenance reimbursement. For facility acquisition, school districts risked the future of the project on bond campaigns, which ultimately proved to be successful.

From the beginning of the project, funding seemed to be speculative and elusive. It was through sheer persistence and determination in keeping the project momentum moving forward that funding solutions were discovered. Without this level of persistence and determination it would have been easy, as roadblocks presented themselves, to abandon the project or focus on addressing some of the regional needs in a less comprehensive manner.

Resource development was particularly difficult for the steering committee and caused the project to be delayed by two years; however, members were persistent and continued to try a variety of funding opportunities and sources. Resource development was referenced five times in the context of energy for the

project. There were no other relationships identified with regard to resource development by the interviewees.

Grants

Financing the development of the CAL was incremental and oftentimes in doubt. A variety of potential funding sources for initial startup costs were examined. Those included grants, private sector donations, state and federal appropriations, and bond initiatives. Grants were developed and submitted to the National Science Foundation, Fund for the Improvement of Post Secondary Education, the Bill and Melinda Gates Foundation, and others. These grant opportunities as well as private sector donations and state and federal appropriations were not realized.

The first source of funding came from the Regional Strategies Board in the form of a small grant to examine the feasibility of such a project. It was not until several years later that the project was awarded a series of grants from the Oregon Department of Education for charter school design and implementation, while capital outlay and operational costs continued to be elusive during the first three years of development.

It was also anticipated that congressional appropriations and state legislation would help fund some of the start-up costs. Senators Gordon Smith and Ron Wyden were approached and \$1.6 million was requested for infrastructure to support curricula. At the state level, Karen Minnis sponsored HC 1500, which was

to provide \$11 million from economic development funds to establish centers statewide. Those efforts did not prove to be successful either (CAL Steering Committee, 2001a). In June 2001 Minnis again committed herself to obtain \$800,000 from the state legislature for the CAL; however, with huge state budget cuts anticipated in the following biennium those efforts were in vain "...all in all, there were three of them [Senate bills]. They would make it as far as Christmas tree funding, and then they would just die on the floor" (Interviewee #9, February 12, 2002).

There were provisions in the last legislature to try and provide categorical funding for the project, so I think there is support, and now it's just a matter of, can dollars follow. Sometimes, you have to have the concept first be approved before you see resources follow, so I think it's going in the logical pattern. I think that resource development, the facility planning, the logistics, the budget piece and operational aspects of the Center are key components. Doing the resource development, the charter grants, looking at industry, doing the Intel grants, all the resource development has been a strain on this thing (Interviewee #13, March 15, 2002).

Grants that did become available were primarily from the Regional Strategies Board or the Oregon Department of Education. The Oregon Department of Education provided Public Charter School Incentive Grants to assist newly approved and operational charter schools in meeting their identified planning, start-up, and implementation needs. Those grants included (Table 15):

Table 15. CAL Developmental Grants

Date	Granting agency	Purpose	Amount
10/01/99	Regional Strategies Board	Feasibility	\$20,000
4/12/00	ODE	Charter School Incentive	\$10,000
10/20/00	ODE	Charter School Incentive	\$10,000
12/19/00	ODE	Charter School Incentive	\$1,100
5/8/01	ODE	Charter School Incentive	\$7,500
8/1/03	ODE	Charter School Implementation	\$272,400
Total as of 5/02			\$320,000

(Oregon Department of Education, 2001b)

These incremental grants, which helped keep the project going and funded the research, site visits, and curriculum development, are "...probably well over \$320,000 in funding to create the idea, to refine the curriculum, the design of the program, [and] to help with the implementation costs" (Interviewee #13, March 15, 2002).

Bond initiatives

Local school board bond initiatives proved to be an effective, albeit risky, method of developing resources. The steering committee, school boards and supporters of the project effectively carried the message to voters:

To get our Board and the community to vote on a bond measure that supported the Center for Advanced Learning depended on so

many other things. My board was amazing by being out front and upfront about this initiative [on influencing voters].... Trying to simplify what it was, was part of it. We had to characterize that this was for all kids. To provide opportunities for outstanding scholars and being entry point for others. There was an absolute commitment in the district for each child. This would not have been successful if this project were for a small elite group. ... We had to characterize the possibilities for the future... the fact that there were good paying jobs in the community. The other piece was dropouts, the lack of engagement... (Interviewee #5, February 18, 2002).

Construction contributions from participating school districts included both revenue produced from successful bond activities as well as cash (Table 16):

Table 16. District Contributions

School district	Construction contribution	Contribution as a % of total	Student slots allocation
Gresham-Barlow	\$4,800,000	49%	289
Reynolds	\$2,000,000	20%	120
Centennial	\$1,513,000	15%	91
Corbett	\$1,500,000	15%	91
Totals	\$9,813,000	100%	591

(CAL Steering Committee, 2002d; City of Gresham, 2001)

Centennial, Gresham Barlow, and Reynolds School District bond measures and cash contributions raised \$8,313,000, dedicated exclusively to the Center for Advanced Learning. Corbett School District contributed an additional \$1.5 million in May 2002.

Anticipated revenues for the CAL consist of funding grants of \$400,000, donations from local private sectors, and tuition for students taking part in the Early

Collegiate Opportunities program sponsored through Mt. Hood Community College, state ADMw reimbursement, and excess space that potentially may be leased.

The partnership model adopted by participating school districts allocates ownership and cash investment based on the relative ratio of students in each of the participating high schools. The proposed operational budget accounts for this distribution of students and the ADMw they will generate from state reimbursement (CAL Business Managers, 2001). Table 17 shows the anticipated operational budget apportioned by student allocated slots.

With Gresham-Barlow taking the lead in financial planning, it was determined they would also act as the CAL fiscal agent. Their responsibilities include: 1) budget, financial reporting, and auditing services, 2) accounts payable and receivable, 3) risk management, 4) records management, 5) maintenance of accounting policies, 6) ensuring procedures are consistent with generally accepted accounting principles, 7) compliance with state and federal regulatory agencies, 8) following Oregon public contract rules, 9) fidelity bonds for employees, 10) discrete and separate accounting of all funds, 11) investing idle funds, and 12) receiving district indirect cost rate for services (CAL Business Managers, 2001).

Table 17. Proposed Operational Costs

Cost elements	Centennial	Gresham- Barlow	Reynolds	Corbett	Totals
HS Programs	\$180,143	\$571,506	\$238,128	\$180,143	\$1,169,920
Student safety	\$1,820	\$5,774	\$2,406	\$1,820	\$11,820
Curriculum development	\$1,820	\$5,774	\$2,406	\$1,820	\$11,820
Office of the principal	\$45,622	\$144,735	\$60,306	\$45,622	\$296,285
Care and maintenance	\$26,120	\$82,864	\$34,527	\$26,120	\$169,631
Transportation services	\$2,730	\$8,661	\$3,609	\$2,730	\$17,730
Technology services	\$1,820	\$5,774	\$2,406	\$1,820	\$11,820
Operating contingency	\$24,535	\$77,838	\$32,432	\$24,535	\$159,340
Total budget	\$284,610	\$902,927	\$376,219	\$284,610	\$1,848,366
Cost per student	\$3,128	\$3,128	\$3,128	\$3,128	\$3,128

(CAL Steering Committee, 2002a)

Facilities Development

Passing bond funding initiatives for the acquisition, design, and construction of the facilities in November 2000 acted as a galvanizing force among the partners. They could now see their project from vision to reality. In addition, they demonstrated that, out of sheer persistence, a project of this nature could still

be done during economically tough times. "...they are demonstrating that this can be done not only in tough economic times, but that there is a mechanism to self-sustain this type of an effort through the state reimbursement for student daily allowance" (Interviewee #1, January 8, 2002).

Once that bond passed, and people realized that there was a pool of resources here that was going to make this a reality, then the rest of the conversation started to flow, because it was not just a hypothetical notion; it was a real-life, this is going to happen kind of notion, and at that point it gained a whole lot more momentum (Interviewee #1, January 8, 2002).

The first estimate of costs for establishing a regional technical center for the manufacturing strand included: 1) an estimated site of approximately 11,000 square feet which could be new construction, a leased or purchased structure, remodeled or donated site, or owner integration with Mt. Hood Community College, or local school districts; 2) capital equipment, furnishings, computers, and standard school equipment; and 3) instructional and non-instructional staff, and operational resources and materials such as instructional supplies, textbooks, utilities, maintenance, and professional development. Those 1999 estimated costs are shown in Table 18.

Table 18. Estimated 1999 Site Costs

Cost element	Estimated cost
Site	\$600,000
Capital equipment	\$1,175,000
Staffing (annual)	\$525,000
Operational resources (annual)	\$325,000
Total	\$2,625,000

(Gresham-Barlow School District, 1999)

As the vision gained momentum and other disciplines were considered, it became apparent an 11,000 square facility would not be adequate. By September 2000 the focus was on acquiring a Portland General Electric (PGE) substation and maintenance facility, located along the metro transit rail system, to convert into the CAL. Estimated costs to acquire that facility and renovate it into a 40,000 square foot school topped \$7.1 million (Schuette, 2000c). One of the superintendents indicated that:

I had an idea of talking to the folks over at PGE about using the site up on Cleveland and Burnside as a potential Center when it got to the site selection process, and then from there, it started creating the energy, the teamwork around where should it be created so the partners started getting excited about the possibilities. This was another one of those moments they reinvigorated everyone and kept the fires burning (Interviewee #10, February 11, 2002).

The city economic development team assisted in facilitating relationships with PGE and later with the Gresham Station developer who provided the land where CAL would ultimately be sited. "The city has been a great encourager. They certainly have played a vital role in the facility-planning piece" (Interviewee #13, March 15, 2002). In the end, PGE was unable to part with the facility because of fiscal concerns.

I believe PGE actually had a shortage of linemen and some training, so they saw a way that they could leverage a relationship with the school that could be to their own advantage. However, relocating that facility at that time just economically wasn't motivating for them, so they kept postponing it (Interviewee #5, February 18, 2002).

Another challenge was whether we were talking about the program of instruction or about a facility. Is this energy about getting a facility or about creating opportunities for participation in these career areas? We needed to keep our energies focused on the programs, although we often had to spend a lot of time on the facilities and they do relate [which was] another dynamic that was difficult to manage (Interviewee #5, February 18, 2002).

In June 2000 the Steering Committee retained an architect to begin conversations with the community and solicit ideas about constructing a new facility. The Gresham-Barlow superintendent hosted a series of focus groups and planning meetings. These focus groups served not only to obtain design input but also increased the information nodes and connections within the community, thus broadening the network of supporters.

The new construction budget was estimated between \$6 and \$7.2 million dollars for a new building of approximately 60,000 square feet (CAL Steering Committee, 2001b). The final design is a 55,000 square foot facility with 40,000 square feet dedicated to the three academic disciplines and CAL offices with another 15,000 square feet available for expansion and/or addition of programs, or to lease out as a source of alternate revenue.

Summary

Chapter 4 presents the findings of this study, organized around a contextual framework that is used to describe the development, changing nature of the project, and systems dynamics which influence that development and the six key CAL components identified by the steering committee focus group. To provide context

to the system within which the CAL development took place, detailed descriptions of the following are included: 1) participants, 2) the Oregon environment [political, educational, and economic], 3) population and education characteristics, 4) regional workforce concerns, and 5) strange attractors acting within the defined systems to influence system behavior.

Six major components were identified by the steering committee focus group as key ingredients in the development of the CAL. Those six components are: 1) vision, 2) curriculum development, 3) resource development, 4) facilities, 5) partnerships and 6) governance.

CAL development spanned a period of approximately five years, spawned as an idea from three individuals who were concerned about the condition of education in addressing student achievement and regional workforce development needs of the region. Development of the CAL began slowly with isolated conversations between educators and private sector representatives and subsequently developed into an important vision for the region as a potential state model of educational reform.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

"Dissipative structures demonstrate that disorder can be a source of a new order, and that growth appears from disequilibrium, not balance. The things we fear most in organizations—disruptions, confusion, chaos—need not be interpreted as signs that we are about to be destroyed. Instead, these conditions are necessary to awaken creativity" (Wheatley, 1999, p. 21).

The purpose of this research study was to investigate and gain understanding of the factors contributing to successful development of the Center for Advanced Learning as an educational reform partnership project. It is anticipated that others may gain insight and a deeper understanding of developmental processes from a living systems context while examining collaborative educational reform projects from a different perspective. These observations may seem counterintuitive to the traditional linear manner in which educational reform projects are developed.

Development of the CAL, as with all living organisms, is the emergence of properties that are the product of interactions among several elements. The emergent resultant suggests a spontaneous dynamic process that uses different combinations of certainty, chance, and choice. To explain this behavior in purposeful systems is to understand why social systems behave as they do. The complementary nature of chaos theory and systems thinking provides a framework to better understand the development of the CAL. Instead of describing this

development result as a final state of being, it is more useful and compelling when viewed as a process of becoming. In developing the CAL there was no predetermined path, no master plan, and no dominant leaders with apparent hidden agendas. The initial organizers of the project did not envision the development of the project from a systems perspective. Rather, they anticipated a process that was linear, directed, timely, and structured.

Gharajedaghi (1999), in *Systems Thinking, Managing Chaos and Complexity*, asserts that “analyzing the behavior of a nonlinear system is like walking through a maze whose walls rearrange themselves with each step you take” (p. 51). He further describes the relationship between processes for change and synergy for change:

The essence of synergy is management of interactions. It is concerned with development and implementation of processes, systems, and incentives that produce cooperative efforts and alliances that will make the whole of the value chain greater than the sum of its parts (Gharajedaghi, 1999, p. 225).

This chapter discusses four conclusions and three implications of the findings and recommends additional areas for future research. The research questions are addressed in the Summary.

The conclusions are:

1. The ability to sustain development of the CAL as an educational reform project in a living systems paradigm required a degree of flexibility, understanding, trust, confidence, and time to allow for autopoiesis to occur that was not anticipated in the beginning.

2. CAL partnerships evolved in a nonlinear process.
3. Motivations to partner with CAL were the result of environmental factors and strange attractors.
4. Adaptive leadership in development of the CAL played a vital and important role.

The implications address:

1. Systems awareness considerations in project development.
2. Creating and disseminating a clear vision.
3. Curriculum development considerations in a complex project.

These conclusions and implications are examined within a framework of processes for change and synergy for change.

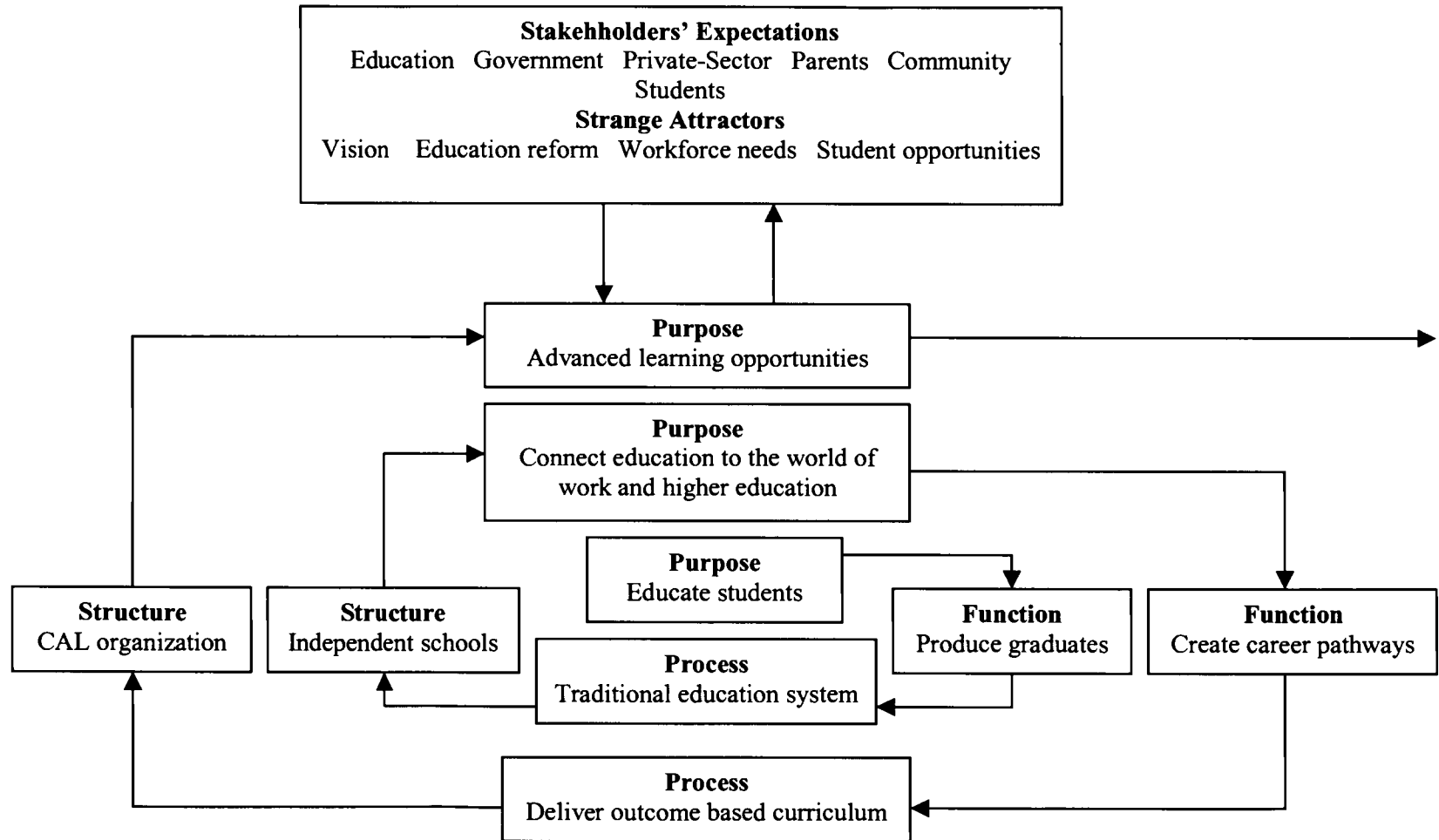
Conclusions

Four conclusions are presented about development of the CAL in a systems context. These conclusions are drawn from: 1) comparing systems components to interviewee explanations of their experiences in terms of what was done well, what was not done well, and what could have been done differently during development of CAL; 2) examination of 469 documents that provided a sense of timing, linkage, and project scope; and 3) observing participants interact in a variety of planning, curriculum development and governance meetings. These sources of data provided a context for both the regional setting and the systems dynamics, and documented change over time.

Conclusion 1: The ability to sustain development of CAL as an educational reform project in a living systems paradigm required a degree of flexibility, understanding, trust, confidence, and time to allow for autopoiesis not anticipated in the beginning.

CAL participants identified six major components of the project that act as subsystems of the whole, between which important synergistic relationships exist. These key components are: “1) vision, 2) partnerships, 3) governance, 4) curriculum development, 5) facilities, and 6) resource development” (Interviewee #1, January 8, 2002). These six components were identified during a focus group by the steering committee as key ingredients in the development of CAL. As a result, interviews and documents were cataloged using these criteria. These six components exist in a symbiotic relationship which influences one another and creates synergy for the project to continually evolve. External environmental factors and strange attractors influence direction. Four strange attractors were identified: 1) vision, 2) educational reform, 3) regional workforce development concerns, and 4) a regional desire to provide significant learning opportunities for students, and will be discussed in greater detail later. Figure 5 is representative of this circular iterative process in which one component influences another and then again influences the original component. This circular iterative process serves to continually change the purpose, structure, and function of the project. These relationships also served to sustain the project during periods when support waned

Figure 5. Circular Iterative Process



and funding seemed elusive. One interviewee explains the complex nature of these relationships:

So, I think what we would do differently is, we would probably have created the timeline and decision making so that the governance piece would be first, followed by what came next [which] was much more of the curriculum [development] notion, which came to another notion about what effect that curriculum has on the logistics of educating these students in more than one location (Interviewee #1, January 8, 2002).

Although the vision changed with time, it created a sense of excitement, economy of scale, and value for the community. Potential partners were attracted to the vision, and with partner participation that vision fueled the process of change. The vision and regional economy served as strange attractors for the private sector and encouraged their participation. One interviewee indicates the relationships that exist between components as they behave as a living system:

I think if we are talking about a project that involves different entities, different districts, different partners, it's one that has to evolve. It has to germinate and it has to grow. You're never sure about what the cell division is going to be, and what little organ is coming next, but I'm not sure we could have done anything differently in terms of process (Interviewee #13, March 15, 2002).

These interdependent variables formed a circular relationship. Each variable co-produces the others and, in turn, is co-produced by the others. They happen at the same time and continually influence the nature of the other. This phenomenon is found among self-generating pairs of interdependent variables within a system (Gharajedaghi, 1999).

As part of a living system, CAL developmental dynamics included: 1) a pattern of organization that is the configuration of relationships among the system components which determines the systems' essential characteristics, 2) a structure that is the physical embodiment of its pattern of organization, and 3) a process of continual change. The key characteristic of a living system distinguishing it from a mere set of objects with relationships that exist between those objects and their attributes, is that a living system inherently continually produces itself.

Autopoiesis refers to this ability of self-organizing systems, operating far from equilibrium, to shift to a new state when their components generate unlikely combinations. Autopoiesis is a pattern of evolution in which the function of each component is to participate in the production or transformation of other components in the network (Capra, 1996; Gharajedaghi, 1999).

From the beginning, the CAL vision was simple and concise. It addressed two major needs of the region: 1) to provide a continuum of opportunity for students that was connected to the world of work and higher education, and 2) to provide a better prepared workforce for the region. Although the vision became more refined with time, those two elements captured the imagination of educators, government officials, and representatives of the private sector. The evolution of this project became an iterative process in which purpose, function, structure, and process continued to change with the synergistic interaction between participants, the vision, and the curriculum development process. This set of interdependent variables formed a circular relationship and with each additional iteration of the

process continued to transform each variable. This circular iterative process is used to holistically describe the development of the CAL.

Gharajedaghi (1999) describes this framework as a process of inquiry, which defines the systems boundaries and environmental factors. He indicates that a living systems' boundary is defined by understanding the behavior of its stakeholders. In understanding systems behavior we must therefore know: Who are the major stakeholders and partners? What are their expectations? What are the desired properties of the system from their perspective? What is their influence? Which variables do they control?

To illustrate, in 1998 the purpose of the existing state and regional educational system was to educate students. The function or output of that system was to produce high school graduates. The process included the intake of students into traditional programs that were not intentionally connected to the world of work or higher education. The structure consisted of independent school districts and a community college. The next iteration in this circular relationship was redefining the purpose with a vision that deliberately connected the world of work and higher education. By redefining the purpose, the function within the system was now changed to begin the process of connecting education with the private sector and providing students career pathway opportunities. The change in function in turn influenced the structure and engaged potential partners in new conversations with an emergent steering committee. That structural change in the regional education system further influenced the process. The focus of the process now changed to

one of curriculum development, which again influenced the purpose, and so the iterative circular relationship continued. With each iteration, a greater synergy, understanding, and proximity of the new whole emerges.

This greater understanding of the whole influenced the manner in which the six key components of the project interacted. For example, as the purpose was altered, so too was its affect on curriculum development. Curriculum development in turn influenced facility design, and instructional media and equipment selection. Those then influenced resource development and logistics. This autopoiesis, although not always a conscious act, was a product of choice, chance, certainty, and the environment. Wheatley (1999) states that, "in a dissipative structure, anything that disturbs the system plays a crucial role in helping it self-organize into a new form of order" (p. 21).

Figure 5 describes this circular iterative process in the context of the CAL. The strange attractors are identified as vision, education reform, regional workforce development needs, and a desire to provide significant learning opportunities for students. These strange attractors and stakeholders expectations provided the stimulus to initiate and sustain the CAL project. As the project developed, purpose, function, and structure of this system continually influenced each other and in turn caused each component to continually change. The result is a continually changing system; changing in response to influences that created previous change.

As this project evolved, so to did the partnerships. It was anticipated there would be times during the development of this project that the private sector would

be more likely to partner. That did not prove to be true. The private sector came into the project at various times throughout the duration. External environmental factors that influence the primary mission of private sector organizations proved to be most influential in determining when the private sector was more likely to partner and when they decided to leave the project. Those external environmental factors included a downturn in the national economy with a greater regional impact than most of the country, which led to reduced revenues, corporate layoffs, and a concern for future viability of the corporations. In addition, several internal factors contributed to private sector participants leaving the project. Those included: 1) a level of frustration with the processes, 2) a perceived lack of progress (i.e., the project seemed to languish at times with no clear end in sight), and 3) a concern they were being asked to contribute more resources than they were willing to give. The private sector expected more immediate results directly related to improvement in the quality of the regional workforce.

At times, a lack of understanding and flexibility resulted in participants leaving the project, waiting on the sidelines to "see what happens," or withdrawing from the project altogether. Two private sector companies were in it from the beginning for the duration. While the private sector was free to come and go at any time, a better approach may have been to wait until the project was more defined and success assured to recruit potential partners. When creating a new organization, a greater understanding of systems thinking by participants and

potential partners helps create a greater degree of flexibility and synergy for change.

Although participants were not generally familiar with systems thinking nor was there an intentional effort to promote autopoiesis, those systems dynamics did occur. Examples of self-organization, self-regulation, and self-generation were prevalent throughout the project. For example, self-organization was particularly prevalent in the beginning when no formal structure existed and no single leader was appointed. Individuals began to discuss the concept of developing a regional educational project and as interest grew, groups emerged and the purpose, function, and structure began to take shape. Another example is the self-regulation that grew out of self-organization. As the project developed, the need for structure became more prevalent, which required increasing degrees of regulation. The project began with informal discussion groups that lead to development of a steering committee, which lead to the appointment of a coordinator and a formal governance structure articulated in written documents.

What is clear is that there were times a more directed and linear approach may have been a more appropriate approach to an element of project development, and at times autopoiesis should have been allowed to flourish. Depending on the time available, the number of participants, and the influence a particular system component may have on the other components, developers would be wise to consider evaluating whether a more directed approach or supporting autopoiesis may be the most appropriate method. For example, development of the vision and

initial planning were clearly the result of autopoiesis, which resulted in an effective and creative approach. However, the curriculum development process became too unwieldy and untimely when autopoiesis was permitted unchecked. In this instance, frustrations ran high, the process was characterized as inefficient, and a more directed approach could have been the more effective method.

It is suggested that if planners and participants are familiar with systems thinking and dynamics, decisions could be made regarding the level of efficacy, freedom, and creativity desired during the project that, in turn, would impact the effectiveness and duration of the project. There is an appropriate time for a more linear approach and a time to permit autopoiesis to run its course.

Developing a project from a systems approach requires a level of knowledge and understanding of living systems and dynamics, and greater flexibility from the participants. It is suggested that project managers considering these types of projects and a systems method of development may want to conduct capacity building for participants in order to create a greater understanding of the nature of living systems and its processes, and for participants to be comfortable working in an environment in which autopoiesis is active. Capacity building was conducted for curriculum development participants; however, appropriate internal controls were not instituted.

In another example, participants in CAL did not intentionally develop a comprehensive strategy for information dissemination until it was decided to promote bond initiatives as part of resource development. Had an intentional

strategy for information dissemination been developed sooner, it is speculated by participants that the project could have been accelerated. It is further speculated by this researcher that development of the CAL might have been accelerated had educational managers used a systems thinking paradigm and implemented strategies to: 1) provide systems awareness training for participants that included an overview of systems theory, a common language, archetype examples, and an understanding of regional environmental factors, 2) develop a strategy to mitigate the effects of territorialism between educational institutions as well as between private-sector organizations, 3) reinforce the need to continuously learn from one another, and 4) create an open environment that develops a climate of tolerance and patience for diverse perspectives.

In summary: 1) vision, 2) curriculum development, 3) partnerships, 4) governance, 5) facilities, and 6) resource development were identified as key components of CAL and these components were significantly influenced by environmental conditions and strange attractors. In addition to vision, which is considered an organizational strange attractor, educational reform, regional workforce development concerns, and a regional desire to provide significant learning opportunities for students significantly influenced behaviors and the systems with which CAL was developing. This interaction continually altered the purpose, function, processes, and structure of CAL. Participation in the CAL developmental process with these dynamics of an ever-changing environment

required: 1) flexibility, 2) understanding, 3) trust, 4) confidence, and 5) time to allow for autopoiesis.

Conclusion 2: CAL partnerships evolved in a nontraditional manner.

Partners in Creation

*In the Dance of Blind Reflex,
Tops are the creator of the system,
and Bottoms are the recipients
(or victims) of it.*

*The challenge in stepping out of the Dance
is for the Tops and Bottoms—
each side bringing its unique
experiences,
knowledge,
and skills—
to become co-creator's of the system—
the classroom,
the team,
the department,
the organization,
the meeting,
the family,
the nation,
the world;
sharing responsibility
for its successes
and its failures
in each moment
and in the long-term
(Oshry, 1995, p. 68)*

Types of partnerships that emerged from the CAL project included education-education, education-private sector, and educational-government. Education-education partnerships included Corbett, Reynolds, Gresham-Barlow

and Centennial School Districts, Mt. Hood Community College, Oregon Institute of Technology, and Portland State University. These organizations contributed time, personnel, and fiscal resources to create and implement the vision, develop curriculum, coordinate developmental activities, engage private sector partners, lobby legislators, generate fiscal resources, and develop the facility.

Education-private sector partners included the Boeing Company, Intel, LSI Logic, ImaginIt [previously named Ketiv], Legacy Health System, Synetics Solutions, and Sheetmetal and Electrical apprenticeship programs. Private sector partners were primarily involved in the curriculum development process, providing expertise on facility development and instructional media selection, and providing faculty development and student internship opportunities.

Education-government partnerships were not as readily identifiable. The City of Gresham served as a nexus between economic developers and CAL participants. State and federal legislators were approached early in the project to assist in identifying sources of startup funding. It was not until Oregon State Charter School legislation was passed that funding became available in the form of Charter School Incentive and Implementation grants through which CAL received approximately \$400,000 for incentives and charter implementation. Oregon State Department of Education helped create the contextual landscape by mandating Certificate of Initial Mastery and Certificate of Advanced Mastery implementation and must be viewed as a partner in developing this new educational environment for the State of Oregon.

All three types of partners—education, government, and the private sector—contributed significantly to the sustaining development of the project. Each played a role in influencing the purpose, functions, processes, structure, and the other partners. Without each partner contributing as they could, the project would have taken a different path and may never have progressed to fruition. Managing these relationships proved a complex and challenging task. At times, there were frustrations with partners that potentially could have derailed the project; however, the open and collaborative environment encouraged resolution of issues without alienation while maintaining the momentum to carry the project forward.

Unlike the development of traditional partnerships, potential partners including representatives from higher education, local school districts, and the private sector were free to come and go depending on their expectations and whether or not their needs were being met. There existed an informal open invitation for all organizations to participate within their means. Several school districts did not participate at all because of: 1) an unacceptable level of perceived risk, 2) concerns regarding funding, 3) preoccupation with other projects, or 4) concerns regarding the complexity and logistics of this project. Centennial School District remained in the conversations but did not become a partner until two years into the project. They were reluctant to initially fully commit to the project because they were uncertain of the potential for success of the project. Corbett School District, which had not been part of the initial conversation, committed fiscal

resources and partnered in May, 2002. There was minimal resentment expressed towards participants who partnered late in the process.

It was anticipated at the outset of this research project that partners and potential partners would behave in a manner consistent with education-private sector partnership literature. That did not prove to be true. The partners and potential partners who participated in this project were far more dynamic. It was also anticipated by early educational participants that once a clear case was made for the merits of CAL, the private sector and other educational organizations would readily partner. That also did not prove to be true, which led to frustration because of a lack of understanding about when and why potential partners would commit to CAL. Prospective partners were allowed to enter and depart the project at will and relationships that developed could not be categorized according to traditional methods articulated in the literature. These traditional methods of categorizing education-private sector partnerships view relationships as static rather than as an ever-evolving process. Although partner expectations for becoming involved in the project were not unusual, the degree of freedom each potential partner was afforded in choosing when and at what level to participate *was* unusual.

This degree of freedom, however, created concern for some educators. There was a general sense that the time and effort spent attempting to recruit the private sector during the initial planning phase was not effectively used. What was missing was a clear understanding of what motivates the private sector to affiliate

with education, and when in the life-cycle of an educational project the private sector is most likely to partner.

Earlier researchers identified in the literature common needs, defining goals and objectives, clarifying roles, creating upper level buy-in, communicating, working with more than one partner, and evaluating as characteristic ingredients of effective partnerships. While these examples provide one view of developing education-private sector partnerships, they consist mostly of “things to do” lists and fail to recognize the complex and dynamic nature of partnerships, cultural differences, and timing in the development of these relationships. These examples did not address systems dynamics or their subtle interconnectedness (Casey & O’Leary, 1998; Partnerships for Family Involvement in Education, 1997; Rigden, 1991; State of Iowa, 1995). In a *New Vision for the Two Year Institution of Higher Education*, Copa and Ammentorp (1997) indicate the changing and complex nature of emerging partnerships that must be considered in designing educational systems of the future in a systems context:

In reality, the traditional notion of ‘partnerships’ may not be a sufficiently powerful concept to describe the complex and dynamic patterns or web of relationships that must be considered, the symbiotic nature of relationships that must be sought after, and the responsive and supportive infrastructure that must be nurtured to reach the design specifications for learning outcomes, process, and organization. (p. 2)

Universities were eager to participate, as they understood the value of providing a continuum of opportunity for students, and more specifically, because that continuum potentially could serve as a feeder system for their institutions.

Representatives from Portland State University, Oregon State University, Oregon Health Sciences University, and Oregon Institute of Technology regularly participated in the curriculum design and development processes.

It was the expectation of educators that the private sector would provide expertise, funding, equipment, instructional media, instructors, and opportunities for faculty development and student work-related experiences. Those expectations were not realized. The major form of support for the CAL from private sector partners was in their representatives participating in the curriculum development process. Their expertise was invaluable in identifying core outcomes, requisite knowledge and skills desired in the workforce, suggesting authentic assessments and capstone projects, and providing faculty professional development and student internship opportunities. Further, the private sector agreed to provide instructors for a portion of the instruction at CAL despite previously held reservations. No funding, equipment, or instructional media was provided by the private sector, contrary to previous expectations.

Because there were no formal written partnership agreements between education and the private sector, which provided enormous flexibility, those that chose to remain were ardent supporters. There was no sense of entrapment, obligation, or duress while participating, nor guilt when leaving. This provided a sense of freedom and an enormous amount of flexibility for both the private sector and education. It allowed the private sector the ability to adjust their level of participation based on the current economic environment, viability of their

company in the marketplace, and the willingness to remain engaged with high personnel turnover. The down side to this open arrangement was that there was significant turnover in potential partners and participants, and as new individuals entered the project there was a significant learning curve to overcome. This phenomenon created significant delays in the curriculum development process.

In one instance, when a company elected to withdraw from participation because the expense of the time commitment was too great, their representative decided to continue participating on his own time because he believed so strongly in the vision and merits of the project. Another company, however, chose to continue in an advisory capacity while withdrawing from the curriculum development process because those meetings conflicted with their company golf outings.

Contrary to what the literature prescriptive lists suggest, written agreements with private sector partners were not sought after nor viewed as essential to the success of the partnership. There was concern by some steering committee representatives that if pressure was applied early in the developmental process to secure written agreements from the private sector as a symbol of partnership commitment it might have a counter productive effect and cause unsure potential partners to exit the project. The only signed formal written agreements were among the educational partners, in the form of intergovernmental agreements in order to facilitate funding, design, construction, acquisition, ownership, and operations of the new facility. That intergovernmental agency agreement addressed many

complex funding and governance issues and provided a necessary level of comfort with the partnerships by those school district's boards of education.

The flexibility of relationships that existed in CAL partnerships contributed to sustaining those partnerships. With no dominant leader, autopoiesis manifested itself in an open and collaborative environment. The private sector felt they were in this project as collaborative partners without education forcing an agenda or delivering a preconceived or preexisting system:

Well, that whole thing around what is the commitment up front obviously has to exist, because you need to know what the long-term commitment is. I think the reason we were so willing to buy into it is because, as a business partner from day one, we have been trying to say, especially to state-funded and local schools, you've gotta be more flexible, you've gotta do things faster, you've got to listen to industry and help us figure out how we can partner rather than just, here's our system, and here's how we do it, and you can use us if you want (Interviewee #11, January 7, 2002).

Flexibility proved to be crucial within this complex environment. Although there was frustration expressed over the curriculum development process because of the fluidity of the participants and the length of time it took to accomplish tasks, it was open to all who wanted to participate and at times criticized as being too inclusive. Participants in curriculum development—both high school faculty and private sector representatives—tended to be somewhat transient. This frequently required previously covered materials to be reviewed, creating considerable levels of frustration. Interviewees suggested that limiting the number of participants and organizing into smaller groups might have resulted in a more efficient method of developing the curriculum. In the curriculum development process, a more linear

and directed approach could have been a more effective method rather than allowing autopoiesis to run its course, even though this level of inclusion and flexibility contributed to creating buy-in at all levels.

You gotta have partnerships and buy-in from all the constituents and stakeholders. That means the parents, the school districts, the students, and the spectrum of the continuation of whatever colleges and universities are going to be impacted if this is going work (Interviewee #8, February 3, 2002).

The focus on flexibility and creating a win-win opportunity for all participants was continually reinforced, and was a product of the climate set by the steering committee:

The first thing I was going to say is you need the right people, you need a good vision, you need to understand the timeline that you're up against, and the quality, in this case the quality of the education is more important than the quantity of the education... you have to have the right amount of support, and I think that's what I'm talking about when I'm saying you have to have the right people at the table. You have to have that collaboration, especially on a project like this, where it takes a lot to get it going, and then it will take quite a bit to sustain, so I would think it's real important for the business community, the public and private sector, to know what's in it for them (Interviewee #9, February 12, 2002).

First of all, it is a collaborative effort from several school districts, so instead of being typical territorial issues, they have all set those things aside and have come together to collaborate on a vision for East county of not just the CAL individually, but how it is related to Mt. Hood Community College, and then, ultimately, the bioresearch plant [planned] out in Troutdale. So, I think it is all interrelated (Interviewee #16, April 1, 2002).

Partnerships created during development of the CAL developed in an atypical manner than those described in the literature and may provide an example of how education partnerships can be effectively crafted for the future.

Relationships with a high level of trust and confidence provide enormous flexibility and freedom for the partners to adjust their level of participation commensurate with the influencing environmental factors.

In summary, development of CAL partnerships did not happen as was expected. Educators anticipated the project to be embraced and supported with resources by the private sector, while the private sector anticipated a quicker developmental process with more action and less processing. The act of partnering was in a constant state of flux with organizations free to come and depart the project as they chose. This fluidity led to frustration that was particularly evident in the curriculum development process oftentimes readdressing previously decided upon material because new participants had entered the project. No written agreements were developed between education and private sector participants; however, there were written agreements between education partners that primarily covered their relationship around ownership and management of the facilities and fiscal responsibilities.

Conclusion 3: Motivations to partner with CAL were a result of environmental factors.

It was anticipated at the outset of this research project that the private sector would be more likely to partner at certain times during the developmental process. This did not prove to be true. Potential partners were influenced whether or not to partner by environmental factors, that is factors that were beyond their immediate

control and impacted their business bottom line rather than by a compelling event or circumstance inherent in or unique to the CAL project. While expectations of partners varied from organization to organization, there were several central themes. Educational partners had expectations of the system they were trying to create, which included a desire to: 1) improve learning opportunities for students, 2) develop a continuum of opportunity for students, 3) create advanced learning opportunities, 4) produce an economy of scale in delivering expensive programs, 5) implement Oregon State CAM requirements, and 6) address the regional workforces needs.

Interviews with educators indicated their expectations of other educational partners included: 1) equitably sharing in the costs and benefits, 2) providing the personnel needed for project coordination and curriculum development, 3) avoiding ego and turf issues, and 4) working for continued progress. Education partner expectations of the private sector centered on what resources the private sector could potentially bring to the table, including: 1) technical expertise, 2) funding, 3) facility improvements, 3) curriculum development assistance, 4) instructors, 5) equipment and instructional media donations, and 6) faculty development and student learning opportunities.

Private sector participant expectations included: 1) accessing a better-prepared workforce, 2) wanting to invest in the community, 3) making their presence known in the community, 4) influencing education through and participating in educational reform initiatives, and 5) consolidating a variety of

requests for support from various school districts into one. "Legacy [Health System] is involved in that because they know what they need in highly prepared health service workers. The same is true for Boeing, LSI and Intel" (Interviewee #6, January 16, 2002). Consolidation of support to the school districts seemed to be another motivating factor. "And one of the interests we had was to try and consolidate the assistance, so instead of support to five high schools individually they could help one..." (Interviewee #2, January 9, 2002).

Boeing fundamentally supports education reform, and we know that we need to do some things different in the field of education, and by exposing the students to more real-life examples, opportunities that are currently going on, better prepares them as a future workforce, so the company has always been behind this effort and actively involved in trying to promote the idea (Interviewee #9, February 12, 2002).

Private sector participants who did not stay for the duration listed the downturn in the economy as the primary reason for leaving. Other stated reasons included: 1) too much time commitment, 2) inability to see significant or more immediate progress, 3) working with high schools was an abstraction in terms of any realized benefit for the company, 4) the duration between fruition and seeing any impact on the future workforce, 5) the project distracted from their core mission, and 6) concern that at some point they would be asked to contribute more than they were capable of. The private sector participants who did not stay to partner generally left within a few months of initial contact and participation.

As partners chose to leave the project there was no attempt from the incumbent partners to create a sense of guilt or to strong-arm the organization into

staying. It was truly an open invitation to participate with no adverse consequence for leaving. This provided participants a sense of freedom that resulted in no adverse feelings when they left. Several companies continued to publicly advocate for the project even though they were no longer participants:

So, we really do try to seek out the partnerships, but they take a lot of work to develop, figure out, to understand what the benefit is, and there has to be a return for both of you, so to say up front, 'what are the expectations,' of course we're concerned about that. We don't mind donating things when we can but, obviously, right now in the economic downturn, those aren't the things that are high on our list to donate, either (Interviewee #15, April 18, 2002).

The bigger players in this county—LSI, Boeing, Legacy [Health System]—have been there every step of the way, wanting it to happen, willing to come to meetings, willing to give us help, willing to organize meetings to try and get some more support, those kinds of things. We probably had a little less luck trying to keep some of the smaller east county entities involved... I would speculate two or three things: One, they don't have the resources to commit to even letting people off work to go to meetings as often as Boeing can. Boeing has someone who can just go to those meetings... and LSI has people like that, and Legacy has given Patty that responsibility, but a smaller firm has trouble doing that. Secondly, I think the economy we have gone through in the last year and a half has really got in the way of some people being able to participate, because some people who were at the table early have really felt the downturn in the economy, and they're more interested in whether they are going to survive than whether they are going to participate in building something new at this point in time (Interviewee #7, March 7, 2002).

Several smaller companies expressed concern that their issues would not be heard because of the perceived domineering nature of the larger companies. In particular, one large company was perceived as problematic. This concern was realized early on and expressed with regard to the larger company's presence:

I might have changed how I presented Boeing's involvement in this project... I think I would have approached that differently... I think if [they] could have taken a step back and been quiet for a few months so that we could get the idea out to businesses and education.... I think I would have approached that differently, but it would have been tough.... Somehow I would have wanted to present it more as a business idea, rather than an education idea. If we had been able to do that the whole way through I think we would have been more successful. If we had presented the idea that business would drive the curriculum and the structure it could have been more successful as well (Interviewee #2, January 9, 2002).

Several companies that chose not to partner with the CAL expressed this concern:

The only inhibitor to this project was the big elephant in the room, Boeing, and [they were] well aware of that. As far as other companies, Boeing was one of the primary stakeholders, which was part of the problem; they did scare some of the other companies off (Interviewee #2, January 9, 2002).

From another company's perspective, "I looked at them [Boeing] coming in at the last and saying, 'Oh no, we can't do it this way, you've gotta do it this way'" (Interviewee #7, March 7, 2002). Another related concern was whether companies could work together while competing for the same labor pool that was being produced.

...there is a reluctance for any one company to jump in and participate with things like this if somebody else is coming in that's a competitor, because they don't want to invest the time and effort, and with Boeing as a participant, that's one of the things that happens. People say, 'I'm not going to get involved with that, because Boeing is just going to take them all, anyway' (Interviewee #11, January 7, 2002).

As a result of their CAL experiences, school districts were encouraged to become more collaborative in other nontraditional partnership projects. CAL provided educators learning experiences in participating with other organizations in complex collaborative relationships. This has created a collective confidence to look at other mutually beneficial collaborative opportunities, as articulated by one of the participants:

One major benefit of participating in the CAL project is the fact that the districts now are collaborating on other aspects... I think we're seeing the three districts coalesce on a number of things that would never have occurred without this. I think we are seeing at some level a replication of the effort and process learned in CAL. The result is blending or dissolving of some of the boundaries. The gray areas are becoming broader, and that's really helping. The other part that we're seeing, maybe that this has fostered in terms of intergovernmental possibilities, is our discussions with the county about the division of human services. With the state, we're pushing now the whole conversation on integration of services because I think we're seeing the possibility of governments and agencies working together more collaboratively than we saw in the past (Interviewee #13, March 15, 2002).

Examples of other regional complex collaborative projects involving these partners include: 1) Natural Resource Academy—a collaboration between Reynolds, Parkrose, Barlow, Sandy, and David Douglas High Schools, 2) Finance Academy with David Douglas and Reynolds High Schools, 3) apprenticeship boot camp between CAL partners and the Sheetmetal and Electrical apprenticeship programs, and 4) establishment of the Ford sponsored Maintenance and Light Repair program at the high school level. Previously, this program was only available at the community college level.

Private sector representatives indicated the primary motivations for partnering were environmental factors. These influential environmental factors are defined as variables within a system that influence behavior over which participants have no control (Gharajedaghi, 1999). The system in this instance encompasses the greater Portland metropolitan region of Oregon, and the environmental factors include the state of the national and regional economy, state tax revenues and budgets, viability of corporations, workforce preparedness, future industry trends, and future economic trends. A greater understanding of these motivators in a systems context could provide educators a strategic advantage or leverage in the establishment of partnerships.

In summary, the expectations of partnering varied between education and private sector motivations. Education partner expectations of the private sector centered on what resources the private sector could potentially bring to the CAL including: 1) technical expertise, 2) funding, 3) facility improvements, 3) curriculum development assistance, 4) instructors, 5) equipment and instructional media donations, and 6) faculty development and student learning opportunities. The private sector expectations were: 1) accessing a better-prepared workforce, 2) wanting to invest in the community, 3) making their presence known in the community, 4) influencing education through, and participating in, educational reform initiatives, and 5) consolidating a variety of requests for support from various school districts into one. The most significant factors influencing the private sector to partner or not were environmental factors including: 1) the

condition of the national and regional economy, 2) state tax revenues and budgets, 3) viability of corporations, 4) workforce preparedness, 5) future industry trends, and 6) future economic trends.

Conclusion 4: Adaptive leadership in development of the CAL played a vital and much more important role than anticipated.

“A fresh and unorthodox brand of leadership is necessary to initiate and shepherd an adaptive journey. Adaptive leadership makes happen what isn't going to happen otherwise” (Pascale et al., 2000, p. 8).

The role of leadership in guiding the development of a system is oftentimes misunderstood. Typically, a leader is formally appointed, then viewed as the champion of a cause and progenitor of the vision. Initially in development of the CAL, there was no one individual formally appointed as the director or project leader, no one individual responsible for the vision, and no one champion of the cause. Also, the vision inspired many to take responsibility and act as a leader or facilitator and components of the project self-organized and became self-directed. As a consequence, the leadership that emerged was shared and adaptive. Others chose to participate as followers by contributing supporting behaviors to task and goal accomplishment by providing supportive technical, interpersonal, and cognitive skills.

The roles that participants assumed varied based on their commitment and time available. Some provided their labor as part of job responsibilities while

others volunteered in their spare time. There was a sense of shared leadership and responsibility to accomplish this project. Even in the face of a downturning economy, reductions in the state budget, an initial lack of success with partnership recruitment, and elusive funding opportunities, most education participants and many private sector representatives stayed the course.

Leadership roles were shared and individual advocates also assumed multiple roles. The initial group of three provided insight and leadership in early conversations with the community and created interest for the project in the private sector. "The point is that you had all the key stakeholders spending a couple of afternoons investing their time and energy and agreeing about what this should look like and why it's the right thing to do, what will be the value to the community" (Interviewee #10, February 11, 2002).

The Director of MHREC assumed the leadership role one year into the project, for coordination of curriculum development, fostering the partnerships, and dealing with many of the logistical issues. The superintendent of the Gresham-Barlow School District assumed responsibility for creating excitement with her Board of Education and the community, and for facilities development. The superintendent of Reynolds School District provided leadership in gathering regional private sector, government, and educational leaders to the initial conversations and guided those early meetings:

...the superintendents of the school districts, because of their support for CAL, enthusiasm for the idea, being able to carry that forth and plan and develop it has certainly been key... It's again

that cooperative, collaborative attitude that they all have (Interviewee #12, March 16, 2002).

One superintendent indicated that passion, commitment, and emergent leadership at all levels contributed to success:

I had a passion for the project and continued to provide leadership for the project while I was there. Renee Sessler and Kathy Rithruff, both Board of Education members, are in many ways were the real mothers of the Center for Advanced Learning. They had a real commitment of what was needed for kids. Board passion... and one other really smart thing I did in addition to supporting where the passion was, was reorganizing the assistant superintendent's responsibilities in asking [him] to step out of line operations and take on the community partnerships for the Center for Advanced Learning (Interviewee #5, February 18, 2002).

Assistant superintendents from each participating school district provided leadership on the steering committee and leadership within their own districts for conveying the vision and being the point persons for identifying issues, creating conversations, and solving the logistical details related to developing, orchestrating, and operating the CAL.

City of Gresham official provided leadership in connecting the CAL with economic development and identifying potential sites. Regional representatives to the state legislature brought attention to the value of regional solutions to education in workforce development needs. Private sector representatives and faculty from the college, high schools, and universities provided the expertise in developing curriculum.

In working with the public, steering committee members, school administrators, and city officials demonstrated understanding of how to market the

CAL concept, create buy-in and excitement at all levels, and how to foster relationships that would carry the CAL into the future.

No one really understood what it was, so you started having different other folks in the community saying, well it has to be here, and it has to be there, and you started to get kind of this tug-of-war effort going on, because now it became this prized commodity instead of just a vision of this important institution that is going to help revolutionize and redirect our community, the job growth, education—it was something visionary. So, once again, I wouldn't underestimate the power of leadership on all levels, and the importance of creating an organization that allows every level of people within the community to be a part of it.

Establishing the core leadership and a forum for as many people as possible who wanted to be a part of it... you don't just leave them along the way, you find a way to continue organizing them... you must understand the importance of maintaining relationships for preservation of the future, because what's going to happen is the CAL is going to continue to need things, and if you only use people when you need something from them, you don't empower them to be a successful part of the process for the future (Interviewee #10, February 11, 2002).

Decision-making was conducted at three levels. Decisions that impacted future CAL operations such as curriculum design, facility design, and selection of instructional media were made by consensus of participants. Decisions regarding implementation of policies, procedures, and resource allocation were made by the steering committee. Decisions regarding policy, direction of the project, and resource acquisition were made by chief executive officers of private sector partners, superintendents of school districts, and their boards of education. This proved to be an effective strategy in keeping all constituents engaged. Everyone who participated and contributed to the various components of the project at all levels played a role in the decision-making process. This level of empowerment

created a will to act by participants and increased the power or synergy of the organization.

While individuals emerged to assume leadership and followership roles, one strategy the steering committee implemented was to leave resourcing decisions to the superintendents and private sector chief executive officers. The role of the steering committee was to identify decisions that needed to be made, create conversations addressing those issues, gather appropriate data, and present options to the superintendents and chief executive officers. The result was that when decisions were made at the highest level of the organization, the effect was higher levels of alignment among employees in those organizations with the CAL vision. Decisions made at that level had a much greater impact because they carried more weight, had more staying power, and empowered those participating in the project with a sense of freedom and commitment. One member of the steering committee indicated:

When key decisions were made at the superintendent and chief executive officer level they stuck. It left no doubt for us worker bees what the future direction was intended to be. We were then allowed to use our creativity in implementing those decisions (Interviewee #10, February 11, 2002).

Policy decisions made at the highest level of the organizational partners ensured that: 1) decisions are aligned with their organizational priorities and goals, 2) employees are more likely to be aligned with the vision of the CAL, and 3) as one member stated, a decision at that level has more “sticking power.”

Adaptive leadership and effective followership requires operating from a systems paradigm and need to be open, receptive, flexible, adaptive, and knowledgeable of expectations and the environment. In the *Fifth Discipline Field Book* (Senge et al., 1994) it is suggested that most leadership and management skills used by senior managers are more relevant to directed, clearly defined change efforts than to large-scale transformational changes. Managers who lack the transformational leaderships skills necessary to develop organizational change must be prepared to: 1) change their personal style to one that is open, collaborative, and inclusive; 2) reorient to training and team building which develops personnel capacity for change; 3) invest in sustained personal involvement rather than bowing out after a project is initiated; and 4) be patient as results appear after a time delay.

Adaptive leadership can be viewed as the ability to influence that which we do not control. In complex organizations such as a regional educational system, the context in which leadership takes place is a transactional environment. It includes all stakeholders and participants interacting and influencing one another. In this regard we do not control much, but may have the ability to influence greatly if we understand the components of the system, the complex interrelatedness, and systems dynamics. As an influencer we then become co-producers of the system. While living systems tend to move toward order, the role of leadership is to disturb that order and equilibrium by influencing what we cannot control and appreciating what we cannot influence (Pascale et al., 2000).

Gharajedaghi (1999) suggests that to effectively influence in this type of environment it is important to understand the “why”—why components behave as they do. He differentiates this level of understanding from information, which answers the “what” question, and knowledge, which answers the “how” question. The “why” question answers the question of purpose. Understanding the why, or purpose, of a systems component provides an advantage while interacting with that component and the ability to influence. It is this deeper level of understanding of why components behave as they do that provides leverage. In this regard, it is suggested that adaptive leadership is dependent on effectively responding to environmental factors, strange attractors, and understanding component behavior prior to launching new initiatives that impact complex systems.

In summary, development of the CAL resulted from emergent and adaptive leadership. Initially no formal leader was appointed to manage and lead the project. Individuals assumed responsibility for various parts of the project until the director of the Mt. Hood Regional Education Consortium was appointed part-time as coordinator for the project. Decision-making was conducted at three levels. Decisions impacting future CAL operations were made by consensus of participants. Decisions regarding implementation of policies, procedures, and resource allocations were made by the steering committee, and decisions regarding policy, direction of the project, and resource acquisition were made by chief executive officers of private sector partners, superintendents of school districts, and their boards of education. Consistent with the literature on education private sector

partner in which systematic change is the objective: 1) partnerships require adaptation to fit each community, school district, and school, 2) organizational mavericks may be a source of creativity, but they need support, 3) leadership is critical in a complex partnership, and 4) leaders who are committed to a program may be more successful than leaders who see themselves as facilitators (Tushnet, Bodinger-deUriarte, Ito, Manuel, & Clark. 1996).

Implications

Implication 1: Systems awareness considerations in project development.

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them." Albert

Einstein

A mechanistic view of the world suggests that the world in general operates as a machine in which chance and certainty play a major role in influencing outcomes while there is little choice. With this view there is little to no ability for a system or organization to restructure, the system acts reactively, and operates effectively in a stable environment. Although we know this is not absolutely true, we often approach projects from a mechanistic mindset and a linear perspective; one that is limited by the perceived system in which we operate. This linear perspective used to describe a system often confines us to a particular structure and defines our behavior. To change behavior we must change structure.

Man-made systems are defined by purpose, but often not very clearly. To many people, the purpose of the educational system in this country is to produce well-rounded educated graduates, to others it is to produce skilled workers, while others may view the educational systems as merely a place of employment or a place to drop off their children. Defining a system is dependant on where one stands in the circle and the perspective that position affords.

In a broad sense, systems thinking incorporates a large unstructured body of knowledge that includes chaos theory, complexity theory, and systems theory. Kim (1994) indicates that if we view the world as patterns of behavior we can manage proactively by managing these accommodations; however, if we go deeper to the systematic structure we begin to see what creates the behavior. This allows us to alter the source of the problem rather than deal with the symptoms. Utilizing systems thinking tools for diagnosing problems creates high leverage interventions that will create fundamental change.

In all instances, a system is a perceived whole whose elements “hang together” because they continually affect each other over time and operate toward a common purpose. The scope of these systems is defined by our view of the world and defined by the boundaries we impose. Systems and system structures therefore are built out of chance, as well as choices people consciously or unconsciously make about those systems (Senge et al., 1994).

In general, the U.S. educational system has remained relatively intact for a century. Changes have come as small incremental interventions implemented at

glacial speed. The private sector is now demanding access to a better prepared workforce to shore up a perceived loss of competitive edge in the global marketplace and government. The public sector is demanding increased accountability and performance. The education system is now under mandate to change, and at an increasing rate. In response to those forces, mandatory performance testing has been implemented and educational outcomes and skill standards have been integrated into curricula, while new industry skill standards are emerging each day. There is an expectation education will become more responsive, more reliable, and more stable in purpose and vision (Lashway, 1999).

On the other hand, the individuals who initially conceptualized CAL did not do so from an apparent systems perspective. Rather, development of the CAL was envisioned as a linear directed project that had a dominant leader, a developmental plan, and a fixed timeline. However, as the project participants began to self-organize and adapt to environmental conditions, these strange attractors influenced system purpose, function, process, structure, and people. As each component of the system changed, so too did that change influence other components and caused them to change as well. For example, individuals participating in development of the CAL brought to bear all their previous experiences and perspectives and may have had preconceived notions about what CAL should be at the conclusion of the process. Those ideas, initiatives, and interactions influenced how others viewed the project. That influence caused everyone to change and learn to varying degrees, which once again influenced interaction and design of the project. Through

certainty, choice, and chance, small incremental changes in the existing system components created the impetus for metamorphosis.

Although creation of the CAL was intentional, not all consequences were. For example, Multnomah County, consistent with other parts of the country, has a 25 percent dropout rate for high school students. Two of the leading causes cited by students are the lack of engagement and lack of connectedness to the “real world.” Student focus groups were used in development of the CAL curriculum. CAL has attempted to integrate student needs into the CAL programs.

Previously, Oregon high schools were required to accumulate credit based on clock hours in order to progress towards graduation. With implementation of the CAM, students will be required to attain proficiency based on state standards, which will be assessed locally. Students are also required to participate in their educational planning with school officials. Combining these factors with the new delivery system of CAL, which includes project-based learning, advanced learning opportunities, and connecting capstone projects to the world of work, it is expected students will be more engaged, motivated, and more likely to persist.

Potentially, with a high level of engagement in project-based, contextualized curriculum connected to the world of work, CAL may be able to make a difference in student engagement and reduce the regional student dropout rate. The expectation is high productivity and high creativity.

In another related example, the CAL curriculum development process attempted to be responsive to, and inclusive of, all stakeholders. As we have seen,

creativity in that process was high but productivity was low; the process continued for twice the anticipated time and material was continually revisited, in part because of the structure and self-regulation of the teams. In this example, strategically thinking about how those teams would function and adjusting the composition and ground rules for the teams may well have created a highly creative and productive process.

From a broader perspective, CAL now is influencing components of a larger system, which in turn may influence the delivery of CIM, CAM, and career and technical education statewide. CAL therefore creates leverage. Similarly, as the regional economy improves and unemployment declines, it is expected that the private sector will become increasingly concerned about the quality and source of their future workforce. As CAL is able to demonstrate its effectiveness through student attainment of CAM and national skill standards, it is speculated that other private sector organizations may be more willing to partner with CAL, and other regions will consider adopting similar educational reform models. Flexibility of private sector-education partnerships should be a major consideration to encourage participation and meet partner expectations, particularly in a dynamic environment with volatile economic strange attractors influencing behaviors.

What the experience with CAL demonstrated was the need for understanding systems dynamics and the ability to think strategically about environmental factors, the interrelatedness of systems, the myriad of possibilities, and the processes that impact all parts of a system. It is suggested that educators

and project managers interested in developing private sector partnerships could have a greater degree of success in attracting potential partners if there were a deeper understanding of environmental factors and how those factors interact with strange attractors to influence behaviors.

Understanding systems dynamics provides the participant with additional tools to see complementary relationships, which on the surface may appear as opposing tendencies. However, those opposing tendencies do not represent an “either/or” solution; to a systems thinker they represent a continuum of possibilities. This concept of multidimensionality suggests that opposing tendencies are a zero sum game where there is a right and a wrong alternative, or a winner and a loser. Multidimensionality of a system means there are many structures with multiple functions depending on the view, and there are many possibilities. For example, in the beginning there was no intent for the school districts to jointly pursue bonds as a source of CAL funding. It had been anticipated that a combination of funding from the state legislature, grants, and the private sector was assured and would provide the major source of funding. When those sources did not produce results, rather than abandon CAL, the idea of joint bonding—an idea not previously attempted in the region—was discussed as an alternative funding source. Identifying this alternative solution, not closely aligned with previously considered solutions, ultimately created leverage for the region.

Cause and effect are not always inextricably linked in a complex environment and not always well understood. Cause and effect may be separated

by time and space, and even for events happening concurrently at both a given time and place, there may be delayed consequences which happen at a different time or place. Additionally, one causal event may have multiple consequences. while a given set of causal variables may, over time, be replaced by a different set of variables; for example removing the initial cause may not remove the effect (Gharajedaghi, 1999).

An example of this, which had a far-reaching deleterious effect, is that the company who initially was the most vocal supporter of the CAL concept throughout the state was absent during the curriculum development phase. It was anticipated they would have been the private sector leader during that phase. However, at the completion of the curriculum development process they were unhappy that the focus of the curriculum was not exactly as they had envisioned it. The result was a revisiting of the scope of curriculum. When pressed why they had not remained at the table during the curriculum development phase, a representative of that company indicated that the day of the week the curriculum committee met conflicted with their golf outing. Rather than have all other participants readjust their schedules, they believed the least harmful effect was for them to just not attend. In fact, that was probably the most detrimental alternative, considering it was a CAL goal to meet regional stakeholder's needs.

Systems thinking provides a language, a process, and paradigms (archetypes) to map systems behaviors and provide deeper understanding of systems dynamics. It allows us to see things in organizations as continual

processes rather than as static structures. Understanding systems theory provides individuals with the tools to work from the existing reality toward a new mental model through reflection and inquiry. For example, systems theory would indicate that by asking the question, "What is it we want to create?" we begin to develop a shared vision. To let that vision carry the creation is to allow for autopoiesis. In this regard CAL allowed processes to be invented along the way.

When processes come first in development of a project, we limit possibilities by reacting to the environment, thereby limiting the possibilities of what can be created. When purpose comes first, we open possibilities by creating something into being, something new that can have new structure that can create new behaviors. The difference between our existing reality and our desired purpose (vision) develops creative tension, which now seeks resolution by achieving the new state that is desired (Fritz, 1989).

In summary, choice, chance, and certainty are at the heart of organizational development and systems understanding. Not all cause and effect is in direct correlation in a complex system, nor can these relationships be effectively understood or explained without providing environmental context. As we view the world as increasingly complex, understanding systems dynamics provides: 1) a language, 2) a process, and 3) paradigms (archetypes) to map systems behaviors. CAL is now influencing components of a larger system, other educational institutions within the Oregon educational system, which in turn may influence the delivery of CIM, CAM, and career and technical education statewide. CAL

consequently creates influence and leverage. Therefore, systems awareness creates leverage.

Implication 2: Creating and disseminating a clear vision.

“Vision—It reaches beyond the thing that is, into the conception of what can be. Imagination gives you the picture. Vision gives you the impulse to make the picture your own.” Robert Collier

CAL participants identified vision as the single most important component of the project. The importance of identifying a compelling vision that resonates with key influencers and how that vision is disseminated is critical to developing momentum for a project. Roberts (Senge et al., 1994) suggests that from a systems perspective the challenges of leadership in developing a visioning process are to continue to develop momentum from previous successes, keeping the vision fluid, and aligning the workforce.

Gharajedaghi (1999) suggests that man-made systems interact with purposeful individuals and a purposeful society. The result is a hierarchy of purposeful interconnectedness at three levels in which an optimal solution cannot be found at one level, independent of the other two. “Aligning the interest of the purposeful parts with each other and that of the whole is the main challenge of the system” (p. 12).

In Gladwell’s (2002) book, *The Tipping Point*, he suggests that the reason why social change happens the way it does is that we are influenced by our

surroundings, our immediate context, and the personalities of those around us. The world around us is not necessarily in accord with our intuition and those that are successful in creating change do not do what is intuitively right, but rather deliberately test their intuitions. The underpinning of successful change is a solid belief that change is possible and that people can radically transform their behavior and beliefs with the right kind of impetus. He further suggests that three characteristics of dynamic change are: 1) that the vision is contagious; 2) that little causes can have big effects, thereby creating leverage; and 3) that changes often happens dramatically because of geometric progression in effectively communicating the vision (through nodes and networks).

Senge et al. (1994), in the *Fifth Discipline Field Book*, also share this view:

Shared visions have a way of spreading through personal contact.... Such informal networks are especially vital in bringing about the deep changes in culture and operations which management hierarchies have great difficulty achieving. (p. 301)

In CAL, viewed as a self-organizing system, there was no fixed plan, no mandate to follow, no political agenda being pushed, and no apparent funding to pursue. Rather, a group of three individuals, self-organized based on environmental strange attractors in response to existing and anticipated regional trends, and began to develop a compelling vision for the region's future.

Armed with a vision, those individuals called for meetings with potential partners, thereby increasing the information nodes and connections, and broadening the network of support. Increasing the number of nodes and enriching the number

and quality of connections served to create alignment within the community for that vision (Pascale et al., 2000). The network consequently began to grow, with each component participating in the production and influence of other components to create momentum for CAL.

The power and contagiousness of the CAL vision was initially underestimated. Vision provided a sense of direction and formed the basis for judging all emerging opportunities, creating a sense of excitement and level of buy-in for potential partners. As the project progressed, participants conveyed that vision to potential partners, parents, and school board members. The vision was initially transmitted verbally, as there were no public documents espousing the merits of the project during the first year. Those recipient individuals who understood the vision became connectors which retransmitted the vision to others nodes. The result was an invisible network of supporters within the community. The importance of a compelling vision is articulated by Gharajedaghi (1999): “Without a vision all possibilities would have equal values; there would be no basis to judge the relevancy of the emerging opportunities” (p. 97).

Additionally, Gladwell (2002) suggests that any kind of social change is heavily dependent upon the involvement of people with a particular set of skills. He defines these individuals as connectors, mavens, and salesmen. Connectors, by definition, are individuals who know many other people, but most importantly it is the diversity of people they know that communicates a vision to groups with varying interests. They possess the ability to connect and ultimately influence

many different groups or nodes. This creates much broader dissemination of the message. Mavens are individuals who are well educated on a particular subject and possess a passion for educating or influencing others. Mavens are data banks that are important because they have the most information, while salespersons persuade others when they are unconvinced of what they are hearing. Gladwell further indicates that the combination of these three types of individuals communicating a compelling vision creates a "stickiness factor," as he calls it, that can create social change of epidemic proportions.

By the time the CAL project was made public, there was considerable momentum within education, government, the private sector, and the public at large. Politically, the vision was embraced by both parties, allowing local, state, and federal elected officials, and governmental employees to support the project and publicly use it as an example of positive forces working in the community to improve the quality of the education systems, and ultimately the quality of life. It prompted education to engage with the private sector, something that politicians had wanted to do for some time. Interestingly, the level of political support increased as the project gained notoriety.

By the time the vision was made public, there was little or no resistance to the project. A November 1999 newspaper article publicly captured the essence of this compelling vision for the first time:

Huge questions about the project remain unanswered. No one knows where this regional center should be located, how much it would cost and who would pay. And with so many partners, who

would run the show? The officials in Gresham-Barlow, Reynolds and Centennial school districts seem sold on the concept. So do the folks at Mt. Hood. So do businesses such as the Boeing Company. If they pull it off, the center would represent an unprecedented collaboration between local education and business leaders. This team approach, boosters say, makes sense. With the industry screaming for skilled workers, colleges are crying out for better prepared students, and Oregon school reform is demanding more career related learning, there's a greater need for specialized training, in-depth coursework in real world experience for high school students. (Lawton, 1999b, p. E02)

A follow-up article in December 1999, which included the notion of establishing the CAL as a charter school, illustrates how the vision was embraced by a variety of unlikely constituents and disseminated through connectors to network nodes:

A proposal for a career oriented high school in the Gresham area could end the notion that charter advocates are mavericks. Oregon's leading charter school movement may soon get a very surprising contender: a program hatched not by education outsiders but by insiders—central office administrators. Assistant superintendents from Gresham-Barlow, Reynolds and Centennial districts and a couple of managers from Mt. Hood Community College are developing a proposal for a charter school. Although the concept they are promoting is not unusual—the promoters are. So far, charter school organizers across the state are parents, teachers, business owners, and grandparents; mostly outsiders to the education establishment. (Lawton, 1999a, p. C01)

Keeping the vision simple and communicating it clearly and frequently provided leverage to pass bond initiatives and keep participants engaged.

It is fair to ask, "What is the relationship between a strange attractor and vision?" "Was it the vision that altered the future for education in the region or was it a set of strange attractors that altered the future?" The answer is both. As

education reform initiatives and vision are developed, momentum is gained. This momentum informs the public and alters what people do. In other words, the momentum created by the vision that informs the public becomes in itself a strange attractor. In this respect, the vision for the future is the means for altering behavior. The new behavior then shapes the ends, which in turn alters the future, and so the iterative spiral continues.

To summarize: (1) strange attractors are cogenerative—they arise through convergence of many factors within an organization and its environment; (2) they materialize when what is already present is expressed in a way that provides shape and substance; (3) they flourish in an environment of adaptive challenge and tend to atrophy when subjugated under heavy handed social engineering; and (4) they foster breakthroughs and outcomes that are unforeseen and unimaginable. (Pascale et al., 2000, p. 75)

The CAL vision was communicated using a combination of nodes, connectors, and networks. Nodes are individuals or groups of individuals that have influence. Examples of nodes in a community could be civic clubs or influential individuals. Analogous to a computer network, nodes are hubs that link to others. Connectors, on the other hand, are described as mega-nodes within a complex environment. Connectors exert enormous influence. They are analogous to those few nodes on the Internet that by their sheer size or influence are capable of creating trends, such as Yahoo or eBay. Networks are clusters of nodes. Clearly, in a network, the more links to nodes and connectors that exist, shorter paths are created between any two nodes in the system. The implication is that the greater number of individuals that can be energized, the greater the dissemination of the

vision; however, there is an economy of scale depending on which individuals, nodes, or connectors are energized. Individuals viewed as connectors clearly provide an economy of scale for vision dissemination, as they are capable of providing the widest dissemination for the least effort. Future educational reform project managers might consider developing a comprehensive strategy of information dissemination concurrent with the development of a clear vision. That plan should include use of community influencers and organizations (nodes) who have a clear understanding of which community members can play the largest role in transmitting the vision (connectors), the mode for transmitting the message, and the means. A judicious use of initial resources in a start-up project developed in a complex environment, particularly one which requires a large buy-in from diverse stakeholders, would be to focus on developing a comprehensive vision and the capacity to create a network of dissemination nodes.

In summary, the implication of the measure of success realized by CAL in implementing their vision is that aligning the vision of the organization with the greater vision for the region proved to be a powerful strange attractor.

Organizations desiring to implement regional educational reform projects should consider how the vision for that organization would meld into the greater vision of the region or state. In a larger context, but similar systems approach, the linking of Perkins, TANF and WIA funding for worker retaining and career and technical education programs is attempting to more closely align those three systems with regional and stakeholder needs.

Implication 3: Curriculum development in a complex project.

"One's mind, once stretched by a new idea, never regains its original dimensions." Oliver Wendell Holmes

Traditionally, curriculum development is the purview of the faculty while administrators are charged with resourcing those initiatives. For CAL curriculum, development was done by a collection of administrators, faculty from high school, college and university levels, and private sector representatives. The goal of the curriculum development process was to develop and align as closely as possible an outcomes-based curriculum with college and university level curricula and to meet the needs of industry and incorporate industry skill standards. Although this proved to be a much more complex task than initially envisioned, it has systems implications regarding traditional responsibilities, the roles of participants, and how best to guide a complex process of this nature.

This curriculum development process was the most important and frustrating component of the project and consumed the vast majority of time and effort, primarily by volunteers from education and the private sector. The process was intended to be, and was, collaborative and inclusive, which created inefficiencies and generated criticism from participants.

First, faculty members who participated were not assured they would be the ones teaching the curriculum, so the level of faculty commitment in the process was dubious. Second, curriculum development teams for each discipline were not limited in the number of participants, which in some instances created a revolving

door as individuals came and left the process. With each new arrival there was a significant learning curve that needed to be overcome, which resulted in frequently revisiting previously covered material. Third, developed materials were not regularly disseminated to all participants, which also contributed to discontinuity, revisiting previously decided upon material and prolonging the process.

Consequently, curriculum development proved to be: 1) too inclusive, 2) lengthy—it continued for nearly two years, and 3) frustrating.

Several participants suggested that limiting the number of participants, narrowing the scope of the curriculum, and shortening the duration would have been a more efficient method of developing the curriculum. One level of efficiency that was included in the process was integration of industry national skill standards. The private sector was very receptive to this notion and to some degree encouraged limiting the number of participants and the inclusion of skill standards. Integration of national skill standards also created a higher level of legitimacy for the public in connecting education to the world of work.

To provide for a more efficient and less frustrating process, additional capacity building is needed for participants involved in curriculum development. Capacity building would provide for greater understanding of components of outcomes-based curriculum and contextualized learning. Faculty members who have spent the majority of their careers delivering content and/or proficiency-based curriculum needed considerably more professional development to make the paradigm shift and acquire necessary skills to develop and deliver outcomes-based

curriculum. Interestingly, enough private sector representatives who were less familiar with curriculum development processes were more open minded and more readily accepted an outcomes-based approach.

It is speculated that the curriculum development process could have been more efficient and less time consuming if adequate capacity building had been done at the front end. Identifying faculty at the beginning who would be teaching the new curriculum and limiting the size of the curriculum development teams would also have contributed to a more effective process.

One purpose of the CAL is to create advanced learning opportunities for students. The implication is that students migrating to CAL from traditionally delivered grades 9 and 10 must be better academically prepared to enter CAL. CAL's existence is therefore creating an unintended consequence of change that potentially will cause participating high schools to assess how well students are prepared to progress. These participating high schools may then find it necessary to modify curriculum and/or provide faculty development opportunities to ensure student success. In this process, delivery of the Certificate of Initial Mastery (CIM) in grades 9 and 10 must also be examined. It is likely that the presence of CAL and the need to better prepare students for the selection process may unintentionally cause improvement in student performance at participating high schools.

Also, as CAL influences participating high schools to produce better prepared students for entry into the CAL, there may need to be additional capacity building for faculty teaching in grades 9 and 10 to modify their existing curriculum

and develop a better understanding of project-based learning and authentic assessments techniques to prepare students for selection into the CAL.

The Oregon Department of Education has mandated that the Certificate of Advanced Mastery (CAM) will be implemented beginning in 2004. CAM consists of seven career pathways connecting education to the world of work that is taught in grades 11 and 12. In recent changes to CAM implementation criteria, local school districts will be allowed to assess its effectiveness based on proficiency attainment towards state standards, as opposed to previously considering clock hours as a measure of attainment. Combining this career pathways assessment model with CAL, which is a new delivery system, may radically change how students can progress. This combination may also serve as an Oregon state model for CAM delivery.

In summary, curriculum development in a complex project of this scope needs to be the most intensively managed component of the overall project. Organizations desiring to undertake major curricular changes should consider: 1) defining the process for curriculum development, 2) mandating a timeline, 3) assessing the skill and knowledge level of participants, 4) implementing intensive professional development or capacity building for those participants, 5) providing adequate funding to allow for continuous participation by the participants, 6) limiting the number of participants to only those essential to the process, 7) requiring a commitment by individuals and school districts for the continuous participation of the same participants, and 8) obtaining a commitment from

participants that once a curricular decision is made, the arguments will not be rehashed at subsequent meetings.

Recommendations for Further Research

Lankard (1995) noted that in the early 1980s school reform called for changes that would ultimately transform the nature of education and business partnerships. Early education-private sector partnership researchers focused on categorizing partnerships based on characteristics of successful partnerships, typology of partnerships, and partnership development strategies (Christensen, Epanchin, Harris, Rosselli, Smith, & Stoddard, 1996; Cowan, 1994; Grobe, 1993; Imel, 2001; Partnerships for Family Involvement in Education, 1997).

By looking at partnerships in the context of systems thinking and how each component of this project continually influenced every other component through a circular iterative process, this study begins to explain the development of partnerships in the context of continual change.

The findings and conclusions of this study suggest several additional areas for further research. Those include:

CAM Delivery

The delivery of CAM is a mandated Oregon State educational reform initiative, while CAL provides one model as a delivery mechanism for CAM. The relationship between CAM implementation through the CAL delivery system

requires a further examination to help educators and governmental and private sector representatives better understand the effectiveness and relationship between the program and the delivery system. These relationships should be examined relative to the effectiveness of offering CAM through the more traditional high schools. While most school reform initiatives are incremental, delivery of CAM through CAL, in addition to being established as a charter school, could be viewed as whole-school reform. Lashway (1999) indicates that the American Institutes of Research rated 24 whole-school reform models, only to find three that had demonstrated, through rigorous scientific studies, a strong impact on student learning. Examination of CAL as a whole-school model and the effectiveness of CAM on student learning would be of interest to the State of Oregon in assessing these initiatives, and to other regions interested in implementing a similar project.

CAL Programming

The vision for CAL was originally conceived out of concern for the high dropout rate of regional high school students and concern for a regional well-trained workforce. That vision focuses on providing engaging educational opportunities that lead to higher education and/or the world of work. The object is to produce a better prepared workforce to meet the needs of regional private sector organizations and provide transfer opportunities for those students desiring to attain a higher education. The effect of CAL programming should be examined with regard to the student engagement and proficiency attainment compared with the

goals of CAL and other traditional educational high school programs. Two questions that should be answered are: 1) what impact does CAL have on producing a better-prepared workforce; and 2) what impact does CAL programming and methods of delivery have on student retention? The answers to these questions will help in determining the effectiveness of CAL with regard to its stated vision.

In addition, the migration of students is of interest to school administrators in establishing a profile of which students migrate to the world of work, which migrate to community colleges, and which migrate to four year institutions. CAL was founded on establishing this connectedness to community, the private sector and higher education. The longitudinal effectiveness of CAL in making those connections needs to be examined. A longitudinal study tracking the migration of students would be useful in determining CAL's effectiveness related to its stated vision. Indicators CAL could use in the educational assessment process include: 1) graduation rates, 2) entry into postsecondary education, 3) persistence at the secondary and postsecondary levels, and 4) entry into the workforce.

Economy of Scale

CAL was established as an economy of scale and regional solution to the high costs of career and technical education programs. CAL allowed school districts to pool their resources to offer career and technical education opportunities that each district would be unable to offer on its own. This economy of scale

provides a cost-effective method to deliver what are viewed as expensive programs. CAL cost-effectiveness should be evaluated in regard to how well it serves the region compared with traditional delivery of similar career and technical education programs at other high schools. Should CAL prove to be a more cost-effective delivery method, other regions may wish to emulate this type of partnership, which provides realized benefits to taxpayers, students, and the private sector.

Partnership Effectiveness

CAL was established with the premise that education and private sector partnerships would be important to its development and long-term success. It was envisioned by the early planners that partnerships could provide additional assets and increased student learning opportunities that would result in improved student performance. The long-term effect of CAL education-private sector partnerships should be examined to determine the effectiveness of those partnerships over time and whether or not new partners have chosen to join or existing partners have chosen to leave the Center. Additionally, if partners leave or are attracted to CAL, it would be beneficial to better understand what environmental factors contributed to those decisions. Other school districts and regions contemplating developing partnership projects similar to the CAL may also find this information useful.

Summary

The purpose of this study was to investigate the Center for Advanced Learning and gain understanding of the factors contributing to the development of this partnership project. The following research questions are addressed:

1. Why did representatives from the private sector choose to partner with the CAL? The motivations and expectations that affected development of these relationships were examined and it was determined that educational organizations partnered because of a desire to: 1) improve learning opportunities for students, 2) develop a continuum of opportunity for students, 3) create advanced learning opportunities, 4) produce an economy of scale in delivering expensive programs, 5) implement Oregon State CAM requirements, and 6) address the regional workforces needs. The reasons the private sector decided to partner were: 1) accessing a better-prepared workforce, 2) wanting to invest in the community, 3) making their presence known in the community, 4) influencing education through, and participating in, educational reform initiatives, and 5) consolidating a variety of requests for support from various school districts into one.

2. Why did some potential partners choose not to partner with the CAL? The motivations of private sector representatives of potential partners that choose not to partner with the CAL, along with possible contributing conditions, were examined. The following environmental influenced their decision not to partner: 1) too much time commitment, 2) inability to see significant or more immediate progress, 3) working with high schools was an abstraction in terms of any realized

benefit for the company, 4) the duration between fruition and seeing any impact on the future workforce, 5) the project distracted from their core mission, and 6) concern that at some point they would be asked to contribute more than they were capable of.

One strange attractor that influenced partnering decisions was the economic recession, which adversely affected business operations between 1997 and 2002, and caused many private sector organizations to begin focusing inwardly on operations, production, and strategies that could be, and needed to be, implemented in order to weather economic circumstances. As a result, several organizations stated they were unwilling to commit personnel, time, equipment, funding or other resources to support the CAL project.

3. What are the systems components that contributed to developing this collaborative educational reform project? Four strange attractors were identified as exerting considerable influence on the purpose, structure, function, and processes related to CAL. Strange attractors are those forces within a system that exert considerable influence either by attracting or repelling other components of the systems. When asked what the most significant forces were within the system, several participants identified the strange attractors as: 1) the CAL vision, acting as a strong community and organization attractor, 2) the consistently poor state of the national and regional economy, significantly influencing the private sector, community, voters, and school appropriations, 3) educational reform stemming from federal and state legislation that continued to influence educators and

educational stakeholder behaviors; and 4) an overwhelming desire “to do the right thing for kids” (Interviewees #1, #6, #7).

4. How do elements of the developmental systems encourage sustained progress? It was anticipated that key components within developmental systems would be identified which encouraged sustained developmental progress. The single most important component that kept this project moving forward was a vision that resonated with the community. Although the vision changed over time, it did maintain the essential qualities of improving student opportunities and addressing regional workforce development needs. The project took considerably longer than anticipated to develop because of a lack of funding and identifiable funding sources; however, the school districts and community were so strongly committed to the project that bond initiatives were eventually passed to ensure continued progress towards fruition.

Another important component was adaptive leadership that emerged from participants and adjusted to the changing conditions to achieve incremental tasks which contributed to the entire development and accomplishment. The vast majority of leadership and effort contributed to the project was made by volunteers wanting to make a difference in their community. Consistent with the earlier research, Tushnet et al. (1996) stated that in partnerships involving educational system changes, the following are important considerations: 1) a shared vision and deep commitment can overcome a weakness in program design and implementation; 2) leadership is critical in a complex partnership; 3) leaders who

are committed to a program may be more successful than leaders who see themselves as facilitators; and 4) solving problems using adaptive planning contributes to success.

5. How do educational and private sector systems interact and contribute to the development of this project? Educational and private sector cultures, styles, and priorities are often in conflict with one another; however, the existing research indicates that: 1) participating organizations are challenged to change policies and procedures; 2) partnerships require adaptation to fit each community, school district, and school, 3) organizational mavericks may be a source of creativity but they need institutional support to succeed; and 4) even with confusion about how partnership structure relates to program, the partnership can become institutionalized if there are mutually beneficial goals and equally committed individuals (Tushnet et al., 1996). Generally during the CAL project, there was a level of collaboration and willingness to contribute by both educational and private sector organizations to keep the project moving forward. The one visible exception to this was a cultural difference between a private sector organization and education. The private sector organization did not participate in the curriculum development process because the timing of the curriculum development meetings conflicted with their regularly scheduled company golf outings, although publicly they were one of the primary advocates for curricular changes. This was a major disappointment for the educational participants. Another disappointment for educators, and a minor setback for the CAL project, was the seemingly meager

resources the private sector was willing to commit to the project up front. That decision by the private sector was a result of the uncertainty and poor state of the economy, and insecurity over how long it would take CAL to reach fruition, if ever.

Examination of education, government, and private sector partnerships from a traditional stasis perspective does not adequately consider the nuances and characteristics of a living system. A greater understanding of strange attractors, environmental factors, and the impact of system component influences on other parts of the system may provide insight to create and develop other innovative educational reform projects more effectively. One personal unintended consequence of conducting this study and gaining experience with educational reform, secondary education, and systems thinking is that this researcher is participating in the development and management of a career high school within a technical college, intended to provide career pathway opportunities for high school students.

Although the focus of this study was to answer the research questions, more importantly, this researcher gained a much deeper understanding of systems thinking and the nuances that influence systems behaviors. A systems approach to examining the CAL suggests that understanding developmental processes in the context of systems thinking provides a powerful tool and an opportunity to improve future educational reform projects.

One prospective student, anticipating enrollment in the CAL one year before its doors open, best summed the significance of this project to the project coordinator:

Dear Mr. Lesh:

Hi Mr. Lesh. I am not sure if you remember my face..... Well, anyway, the program that you described to us really, truly interested me.... Thank you so much for your time. You do not know how much this program means to me. Truth is, I have been looking for a program like this for a very long time. I was even considering just going to MHCC for Junior Year, next year. However, I was hesitant because I did not want to leave my Choir (especially Overtones). In short, CAL is my greatest solution. So, once again, I would like to thank you. You have given me, and people like myself, the opportunity to better ourselves (e-mail to CAL project coordinator dated November 13, 2002).

Postscript to the Study

This study focused on the developmental process and did not examine the implementation phase. The implementation phase could be viewed as a period, overlapping with the ending of the developmental phase, during which design and plans were put into practice or action. Generally, this could be characterized with events such as the hiring of the director, hiring and training of faculty, completion of construction, and acceptance of students that began in May 2003.

While conducting member checks with several participants to solicit their perspectives on the credibility of findings and interpretations of this study, several mentioned concerns regarding the implementation phase of CAL, and more

importantly, the ability of CAL to be used as a model for educational reform in Oregon.

The concerns raised are a result of feedback received by participants related to implementing educational reform changes at their home high schools. There was expressed concern among some faculty and staff at home high schools about the impact of CAL on enrollments and the potential for CAL to influence the existing educational paradigm. They were satisfied with the status quo and were not interested in disrupting that paradigm, regardless of whether or not it was the "right thing to do for students." If these attitudes are dominant or prevail even for the near term, educational reform momentum is adversely affected. For example, the perceived inability of high schools to change because of entrenched parochialism does not create improved opportunities for students nor does it improve student performance and national competitiveness.

Comments conveyed were: "People [faculty and staff] are too concerned with their own lives to be concerned about making a difference by supporting change for the systems," and, "In many instances we have dinosaurs operating existing systems and shrinking resources will only exacerbate this situation and those attitudes." This mindset of entrenchment and unwillingness to change poses leadership challenges and concerns about the ability of educational organizations to effectively and efficiently change, even when faced with legislative mandates, community will, and stakeholder demands for increased accountability and reform.

In this context, it is understandable why Oregon educational reform advocates are pressing for: 1) accountable standards and assessment systems; 2) tying funding to performance expectations for schools; 3) funding specific programs needed to adopt a new system; 4) focusing on the underlying governance system for public K-12 education, including re-evaluating the roles of individual schools, districts, education service districts, the Department of Education, the governor, and the legislature; and 5) examining the range of educational models, including charter schools contract schools, and prototype secondary schools (Oregon Business Council, 2000).

The implication is that there may be a difference between creating a new purpose, function, structure, and processes from the ground up rather than converting existing systems to a new paradigm. In either case, for educational reform to be efficient and effective it makes sense to collaborate and develop economies of scale.

REFERENCES

- APA (2002). Report of the school-to-work taskforce: What psychology can contribute to the school-to-work opportunities movement; Evaluation of the STWOA. *American Psychology Association*. Retrieved March 29, 2003, from <http://www.apa.org/pubinfo/school/page4.html>
- Barabasi, A. L. (2002). *Linked*. Cambridge, MA: Perseus Publishing.
- Boeing. (2001a). *Boeing higher education relations*. Retrieved November 20, 2001, from <http://www.boeing.com/companyoffices/educationrelations/highered/index.html>
- Boeing. (2001b). *Educational reform*. Retrieved November 20, 2001, from <http://www.boeing.com/companyoffices/educationrelations/k12/edreform.html>
- British Columbia Teachers Federation. (1996). *Issues in education: Guidelines for education/business partnerships*. Retrieved March 13, 2001, from <http://www.bctf.bc.ca/parents/edubusbr.html>
- Bruce, A., Linhares, D., & Shepard, K. (1998). East Multnomah County professional technical center letter of support: Atlas-CopCo Wagner Inc.
- Buck, J. (1998). Key ideas related to the Technology Learning Plaza: Gresham-Barlow School District.
- Buck, J. (2000). Conversation: Gresham-Barlow School District.
- Buck, J. (2001a). CAL issues: Gresham-Barlow School District.
- Buck, J. (2001b). Business partner visit draft of needs: Gresham-Barlow School District.
- Business Coalition for Educational Reform. (2001). *Managing for high performance*. Retrieved May 29, 2001, from http://www.bcer.org/issue/managing_h_p.cfm
- Business-Higher Education Forum. (2001). *Sharing responsibility: How leaders in business and higher education can improve America's schools*. Washington, DC: American Council on Education and the National Alliance of Business.

- CAL Business Managers. (2001). *CAL business managers report* (Report on ownership, budget, insurance, fiscal agent and construction project). Gresham, OR: Author.
- CAL Steering Committee. (1999a). East County advanced training center governance chart: Author.
- CAL Steering Committee. (1999b). *The Center for Advanced Learning business partners*. Gresham, OR: Author.
- CAL Steering Committee. (2001a). *Center for Advanced Learning resource development update* (Report of CAL resource development activity). Gresham, OR: Author.
- CAL Steering Committee. (2001b). *Programming design charette* (Budget and square footage requirement analysis). Gresham, OR: Author
- CAL Steering Committee. (2002a). *Center for advanced learning agreements*. Gresham, OR: Author.
- CAL Steering Committee. (2002b). *Center for advanced learning agreements*. Gresham, OR: CAL Steering Committee.
- CAL Steering Committee. (2002c). *Articles of incorporation*. Gresham, OR: Author.
- CAL Steering Committee. (2002d). *Charter school operational budget*. (Proposed annual operational budget). Gresham, OR: Author.
- Capra, F. (1996). *The web of life*. New York: Anchor Books.
- Carrell, C. (1998). *East Multnomah County regional professional technical center strategic plan development proposal*. Gresham, OR: Oregon Metals Industry Council and The Boeing Company-Portland.
- Carrell, C. (1999a). East Multnomah County regional professional technical center steering committee meeting minutes, March 18, 1999.
- Carrell, C. (1999b). East Multnomah Country regional professional technical center steering committee meeting minutes, April 9, 1999.

- Carrell, C. (1999c). *East Multnomah County regional professional technical center: Strategic plan discussion draft*. Gresham, OR: Oregon Metals Council.
- Casey, J. C., & O'Leary, S. M. (1998). *The corporate imperative: A business guide for implementing strategic education partnerships* (ED 430270). Boston, MA: University of Boston, Center on Work and Family.
- Center for Educational Reform. (2001). *Charter school legislation: Profile of Oregon's charter school law*. Retrieved November 21, 2001, from http://edreform.com/charter_schools/laws/Oregon.htm
- Christensen, L., Epanchin, B., Harris, D., Rosselli, H., Smith, R. L., & Stoddard, K. (1996). Anatomy of six public school-university partnerships. *Teacher Education and Special Education*, 19(2), 169-179.
- City of Gresham. (2001). *Multnomah and Washington County regional investment grant submittal*. Gresham, OR: City of Gresham and Mt. Hood Regional Education Consortium.
- Clark, T. A. (1991). *Collaboration to build competence: The urban superintendents' perspective*. Washington, DC: Office of Educational Research and Improvement.
- College of Education. (2001). *Summary of selected federal legislation preceding the Smith-Hughes Act of 1917 to 1946*. Texas A&M University. Retrieved May 29, 2001, from <http://www.coe.tamu.edu/~epsy/cded/owrel.html>
- Commission on Skills of the American Workforce. (1990). *America's choice: High skills or low wages!* Rochester, NY: National Center for Education and the Economy.
- Committee for Economic Development. (1998). *The employer's role in linking school and work*. (ED 424418). Retrieved November, 2001, from <http://www.ced.org.docs.sch2work.pdf>
- Copa, G. H., & Ammentorp, W. (1997). *A new vision for the two year institution of higher education: Preparing for a changing world*. Retrieved November 15, 2002, from <http://newdesigns.orst.edu/updates/two-year/section09.html>

- Copa, G. H., & Wolff, S. J. (2001). *New designs for the 21st century: Career and technical education at the secondary and post secondary levels*. Paper presented December 15, 2001, at the Association for Career and Technical Education, Technical Education Division; New Orleans, LA.
- Corvallis School District, Oregon State University, & Hewlett-Packard. (2000). *Science education partnerships*. Retrieved December 3, 2001, from <http://www.seps.org/whatis.htm>
- Cowan, L. A. (1994). *A model for developing business-education partnerships for tech prep programs*. Unpublished Master of Education Thesis, Western Washington University, Bellingham, WA.
- Creswell, J. W. (1994). *Research design: Qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.
- Creswell, J. W. (1998). *Qualitative inquiry and research design; choosing among five traditions*. Thousand Oaks, CA: Sage.
- Danzberger, J., & deUriarte, C. (1996). *A guide to promising practices in educational partnerships*. Educational partnerships program: Office of Educational Research and Improvement, U.S. Department of Education. Washington, DC.
- David, A. (1992). *Public-private partnerships: The private sector and innovation in education*. Reason Public Policy Institute.
- deUriarte, C. (April 1994). *Business-education partnerships: The impact of role-appropriateness*. Paper presented at the Annual Meeting of the American Education Research Association, April 4-6, 1994, New Orleans, LA.
- deUriarte, C. (1996). *A guide to promising practices in educational partnerships* (Guide ED 392980). Washington, DC: Institute for Educational Leadership, Office of Educational Research and Improvement.
- DiVincenzo, T. (2000). Grant letter of support: Ketiv Technologies.
- Education, Partnerships for Family Involvement. (1997). *Building business and community partnerships for learning*. Washington, DC: Partnership for Family Involvement in Education.
- Eisner, E.W. (1991). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. New York: Macmillan.

- Elsner, P. A. (2001). Convening our partners: AACC summit on workforce development. *Community College Journal*, 71(4), 19-23.
- Felise, F. S. (2000). *Teaching scholar partnerships*. American Association of Community Colleges. Retrieved December 5, 2001, from http://www.aacc.nche.edu/Content/NavigationMenu/ResourceCenter/Projctcts_Partnerships/AACC_Projects_and_Partnerships.htm
- Fritz, R. (1989). *The path of least resistance*. New York: Fawcett Columbine.
- Froese-Germain, B., & Moll, M. (2001). *Business-education partnerships: A troubling trend*. Corporate Watch. Retrieved March 13, 2001, from <http://corpwatch.org/trac/feature/education/global/moll.html>
- G. & C. Merriam Company. (2000). *Webster's collegiate dictionary*. Chicago, IL: G. & C. Merriam Company.
- Gharajedaghi, J. (1999). *Systems thinking: Managing chaos and complexity*. Woburn, MA: Butterworth-Heinemann.
- Gladwell, M. (2002). *The tipping point: How little things can make a big difference*. New York: Bay Back Books.
- Gonzales, R. M. (April 17, 2000). *Best practices: Developing higher education and business/industry partnerships*. American Council on Education. Retrieved March 13, 2001, from <http://www.acenet.edu/calec/partnerships/practices.html>
- Greenspan, A. (June 20, 2001). *The growing need for skills in the 21st century*. Speech presented to the U.S. Department of Labor 21st Century Workforce Summit, MCI Center, Washington, DC.
- Gresham-Barlow School District. (1999). *Technology center: Cost for establishing a center*. Gresham, OR: Author.
- Gresham-Barlow School District. (2002). *Center for advanced learning public charter school proposal*. Gresham, OR: Author.
- Grobe, T. (1993). *Synthesis of existing knowledge and practice in the field of educational partnerships* (ED 362994). Washington, DC: Office Educational Research and Improvement; Programs for the Improvement of Practice.

- Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *ECTJ*, 29(2), 75-91.
- Hammock, J. M. (February 2, 2001). *New report calls for better collaboration between K-12, higher education, and business*. American Council on Education. Retrieved May 25, 2001, from http://www.acenet.edu/news/press_release/2001/02february/collaboration.html
- Heisenberg, W. (1958). *Physics and philosophy: The Copenhagen interpretation of quantum theory*. Chapter 3. George Allen and Unwin Edition.
- Hollenbeck, K. M. (Fall 1997). *School to work: Promise and effectiveness*. Employment Research. W. E. Upjohn Institute for Employment Research. Kalamazoo, MI.
- Hudis, P. M. (2000). *Building linkages: Making integrated standards work for education and industry*. Washington, DC: U.S. Department of Education, Office of Vocational and Adult Education.
- Imel, S. (2001). *Business-education relationships and CTE*. Columbus, OH: National Dissemination Center for Career and Technical Education.
- Intel. (2000). *Intel workforce development: Community colleges and Intel*. Presentation made to Portland area community college presidents, November 15, 2001. Portland, OR: Author
- Inter-America Foundation. (2001). *Definition*. Retrieved May 29, 2001, from <http://www.iaf.gov.locdev/locdevdef.htm>
- Kalpan, J. T. (1984). *A study guide to historical antecedents of vocational education: Educational philosophy and federal legislation*. Texas A&M, College Station, TX.
- Kiefer, C., & Senge, P. (1982). Metanoic organizations in the transition to a sustainability society. *Technological Forecasting and Social Change*, 22(2).
- Kim, D. H. (1994). *Systems archetypes I: Diagnosing systemic issues and designing high-leverage interventions*. Cambridge, MA: Pegasus Communications.
- Krefting, L. (1999). *Examining the validity structure of qualitative research. Cases in qualitative research*. Research reports for discussion and evaluation (A. K. Milinki, ed.). Los Angeles: Pyrczak Publishing.

- Lankard, B. A. (1995). Business/Education partnerships. *ERIC Digest; Clearinghouse on Adult Career and Vocational Education*, 156, 1-5.
- Larson, K. (2001). Business partnerships with schools: Policy guidelines for schools seeking to establish and maintain productive and ethical relationships with corporations. *ERIC Clearinghouse on Educational Management*, 2(Fall, 2001), 16.
- Lashway, L. (1999). *Trends and issues: School reform*. ERIC Clearinghouse on Educational Management, College of Education, University of Oregon. Retrieved November 19, 2001, from http://eric.uoregon.edu/trends_issues/reform/index.html
- Lawton, W. (1999a, December 26, 1999). Insiders hatch charter school idea. *The Oregonian*, p. C01.
- Lawton, W. (1999b, November 15, 1999). Skill center looks like two way solution. *The Oregonian*, p. E02.
- Lesh, B. (2000a, November 9, 2000). *Center for advanced learning: Shared vision to reality*. Paper presented to the Gresham School Board, Gresham, OR.
- Lesh, B. (2000b). *NSF grant application*. Gresham, OR: Mt. Hood Community College Regional Educational Consortium.
- Lesh, B. (2001). *Center for advanced learning: Governance of the charter school* (PowerPoint presentation). Gresham, OR: CAL Steering Committee.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.
- Lofland, J. (1971). *Analyzing social settings*. Belemont, CA: Wadsworth.
- LSI Logic. (2001). *School to work*. Retrieved November 21, 2001, from <http://www.lsilogic.com/about/stw/index.html>
- Maddy-Bernstein, C. (2000). *Career development issues affecting secondary schools*. Columbus, OH: National Center for Career and Technical Education.
- Mazzio, S. (1998). East Multnomah County professional technical center letter of support: Boeing.

- Metro Data Resource Center. (1998). *Population growth and demographic change: 1997 to 2020* (Report prepared for Mt. Hood Community College). Portland, OR: Economic/Demographic Research Group.
- Moore, M. T., & Waldman, Z. (1994). Opportunities or obstacles? A map of federal legislation related to the school-to-work initiatives. *School-to-work: What does research say about it?* Washington, DC: U.S. Government Printing Office, Office of Educational Research and Improvement.
- National Commission on Excellence in Education. (1983). *A nation at risk*. Washington, DC: U.S. Department of Education.
- Northwest Regional Educational Laboratory (1998, updated September 28, 2001). *Report says new teachers need STW training*. Retrieved March 21, 2003, from <http://www.nwrel.org/nwreport/dec98/article4.html>
- Oregon Building Congress, (2001). *Mission and goals*. Retrieved December 15, 2001, from <http://www.obcweb.com/>
- Oregon Business Council, (2000). *An assessment of Oregon's K-12 education reform*. K-12 Education Task Force. Retrieved February 3, 2003, from http://www.orbusinesscouncil.org/docs/K12_reform.pdf
- Oregon Department of Education. (1999a). *Oregon public charter school frequently asked questions*. Retrieved September 10, 2002, from <http://www.ode.state.or.us/cifs/CharterSchools/FAQs.htm>
- Oregon Department of Education. (1999b). *Oregon public charter school incentive grant program* (Request for proposals). Salem, OR: Office of Instruction and Field Services.
- Oregon Department of Education. (1999c). CAM implementation criteria and scoring guide: Self-evaluation tool for schools. Salem, OR: Office of Professional Technical Education.
- Oregon Department of Education. (2000). *Certificate of advanced mastery design* (State Board Review CAM Design Draft 2). Salem, OR.
- Oregon Department of Education. (2001a). *Certificate of advanced mastery design* (State Board Review CAM Design Draft 4). Salem, OR.
- Oregon Department of Education. (2001b). *Notification of project approval* (019652). Salem, OR: Office of Budget and Accounting.

- Oregon Department of Education. (2001c). *CAM at a glance* (CAM update Design 3.0). Salem, OR: Oregon Department of Education.
- Oregon Employment Department. (2001a). *2002 Regional economic profile* (Oregon statewide). Salem, OR: Oregon Employment Department.
- Oregon Employment Department. (2001b). *Employment projections by industry 2000-2010* (Oregon and regional summary). Salem, OR: Oregon Employment Department.
- Oregon School Boards Association. (1999). *Charter schools in Oregon* (Report for school boards). Salem, OR: Author.
- Oshry, B. (1995). *Seeing systems: Unlocking the mysteries of organizational life*. San Francisco, CA: Berrett-Kohler Publishers.
- Otterbourg, S. D. (1998). *Innovative public-private partnerships: Educational initiatives*. New York: Conference Board.
- Partnerships for Family Involvement in Education. (1997). *Building business and community partnerships for learning*. Washington, DC: Author.
- Partnership for Learning. (2000). *Promoting quality education for Washington's youth*. Retrieved December 8, 2001, from <http://www.partnership4learning.org/index.htm>
- Pascale, R., Millemann, M., & Gioja, L. (2000). *Surfing the edge of chaos: The laws of nature and the laws of business*. New York: Random House.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: Sage.
- Pletcher, L. (2002). *Pierce County Careers Consortium executive summary*. Lakewood, WA.
- Project Management Institute. (2000). *A guide to the project management body of knowledge*. Newtown Square, PA: Project Management Institute.

- Rezin, A. (1998). *A comparison of industry success of associate degree graduates who participated in cooperative apprenticeship programs versus their counterparts in traditionally delivered programs*. Unpublished Doctoral dissertation, Ohio State University, Columbus, OH.
- Regional Education Laboratory. (1986). *Business education partnerships: Strategies for school improvement*.
- Rigden, D. W. (1991). *Business/school partnerships: A path to effective restructuring* (ED 336813). New York: Council for Aid to Education.
- Robinson, K. (2000). *Centennial's position on CAL*: Author.
- Schuette, G. (2000a). *Center for advanced learning: A regional partnership charter school proposal*: Author.
- Schuette, G. (2000b). *Educational agency partnership agreement*. Gresham, OR: Author.
- Secretary's Commission on Achieving Necessary Skills. (1991). *What work requires of schools: A SCANS report for America 2000*. Washington, DC: U.S. Department of Labor.
- Senge, P. M. (1990). *The fifth discipline*. New York: Currency Doubleday.
- Senge, P., Kleiner, A., Roberts, C., Ross, R., & Smith, B. (1994). *The fifth discipline fieldbook*. New York: Doubleday.
- Spearman, A. (1998). East Multnomah County professional technical center letter of support: QPM.
- Stake, R. E. (1994). Case studies. In N. K. Denzin (Ed.), *Handbook of qualitative research* (pp. 236-247). Thousand Oaks, CA: Sage.
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- State of Iowa. (1995). *Creating partnerships with education; A handbook for business* (Handbook ED402504). Des Moines: Iowa Council on Vocational Education.
- Stern, D., Finkelstein, N., Stone, J. R., Latting, J., & Dornsife, C. (1994). *Research on school-to-work transition programs in the United States*. Berkley, CA: National center for Research in Vocational Education.

- Stiehl, R. (2001). *The center for advanced learning: Stage one curriculum planning documents*. Corvallis, OR: The Learning Organization.
- Trochim, W. M. (2000). *The research methods knowledge base, positivism and post-positivism* (2nd Edition). Cornell University. Retrieved July 1, 2000, from <http://trochim.human.cornell.edu/kb/positvsm.htm>
- Tushnet, N. C. (1993). *A guide to developing educational partnerships* (Guidebook ED 362992). Washington, DC: Office of Educational Research and Improvement.
- Tushnet, N. C., Bodinger-deUriarte C., Ito, D., Manuel, D. M., Clark, M. (1996). *Educational partnerships case studies*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.
- U.S. Congress. (1917). *The national vocational education (Smith-Hughes) Act-S. 703*. 2001, May, 29, 2001. Washington, DC: Author.
- U.S. Congress, Public Law 101-392 (1991). *The Carl D. Perkins Vocational and Applied Technology Education Act of 1990*. Washington, DC: Author.
- U.S. Congress, Public Law 103-227 (1994). *Goals 2000: Educate America Act*. Washington, DC: Author.
- U.S. Department of Education. (2001, September 27, 2001). *Corporate involvement in education*. Office of Corporate Liaison. Retrieved November 13, 200, from <http://www.ed.gov/offices/OIIA/OIA/>
- U.S. Department of Education. (2002). *Introduction: No child left behind*. Retrieved March 21, 2003, from <http://www.nochildleftbehind.gov/next/overview/index.html>
- Vela, J. (1998). Regional professional technical center letter of support: Mt. Hood Community College.
- Vela, J. (2000). CAL grant proposal letter of support: Mt. Hood Community College.
- Washington Biotechnology Foundation. (2000). *Washington Biotechnology Foundation*. Retrieved December 3, 200, from http://www.wabio.com/about/about_wbf.htm

- Weinberg, G. M. (2001). *An introduction to general systems thinking*. New York, NY: Dorset House.
- Weinstein, L. (1995). *Creating partnerships with education: A handbook for business* (ED 402504). Des Moines: Iowa State.
- West Ed. (2000). *U.S. charter schools*. U.S. Department of Education. Retrieved July 20, 2001, from http://www.uscharterschools.org/pub/uscs_docs/gi/overview.htm#definition
- Wheatley, M. J. (1999). *Leadership and the new science: Discovering order in a chaotic world* (2nd ed.). New York, NY: Berrett-Koehler Publishers.
- Wheatley, M. J., Kellner-Rodgers M. (1996). *A simpler way*. New York: Berrett-Koehler Publishers.
- Wills, J., & Kaufmann, B. A. (1997). *Developing and sustaining partnerships: Lessons learned*. Institute for Educational Leadership, U.S. Department of Education. Washington, DC.
- Workforce Learning Strategies. (2000). *Regional skills partnerships*. Salem, OR: Employment and Training Administration.
- Worksite 21. (2000). *Helping employers partner effectively with education*. Retrieved December 3, 2001, from <http://www.worksite21.org/>
- Yin, R. K. (1987). *Case study research; Design and methods* (5th ed., Vol. 5). Beverly Hills: Sage Publications.

APPENDICES

APPENDIX A

Interview Protocol Guide

Project: Factors contributing to the design, development and implementation of the CAL and/or establishment of education-private sector partnerships.

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

Description of the project: The purpose of this study is to investigate the Center for Advanced Learning developmental process and gain an understanding of the factors contributing to education-private sector partnerships that evolved from the CAL experience.

Interview Questions:

1. I'd be interested in knowing how and when you became involved in the CAL project.
2. In what capacity did you participate in the CAL project?
3. Describe your experiences in participating in the CAL project.
4. Describe why your organization chose to partner or not to partner with the CAL project?
5. Did you support the decision to partner with the CAL?
6. What are the key components of the project?
7. What was efficient or inefficient about the development process?
8. To whom should we talk to find out more about education-private sector partnerships in the context of the CAL?
9. Is there anything else you could tell me that would help me understand the willingness of the private sector to participate in this project and partner with the Center for Advanced Learning?

Interviewer:

Thank the individual for participating in this interview.

Assure confidentiality.

APPENDIX B

Observation Protocol

Project: Factors contributing to the design, development and implementation of the CAL and/or establishment of education-private sector partnerships.

Time of observation:

Date:

Place:

Observer:

Description of the project: The purpose of this study is to investigate the Center for Advanced Learning developmental process and gain an understanding of the factors contributing to education-private sector partnerships that evolved from the CAL experience.

Situation observed:

Conditions/setting:

Individuals present:

Action:

Result:

APPENDIX C

INFORMED CONSENT DOCUMENT

School of Education
Oregon State University
Corvallis, OR 97331

- A. **Title of the Research Project.** Education-Private Sector Partnerships at the Center for Advanced Learning: A Regional Educational Reform Initiative.
- B. **Investigators.** Dr. Sam Stern, Professor; and Joseph Dunlap, Doctoral Student. Joseph Dunlap is also the Dean of Science and Industrial Technology at Mt. Hood Community College.
- C. **Purpose of the Research Project.** This study will examine and describe factors contributing to the development of the Center for Advanced Learning (CAL) and the willingness of the private sector to partner with the Center. The CAL is a regional collaborative response to state and national educational reform initiatives. The study will attempt to provide better understanding of the factors contributing to the success of this collaborative partnership project using systems theory as a framework for analysis by examining and integrating the experiences of those individuals who participated in the design, development and implementation processes of the CAL project life cycle.
- D. **Procedures.** I understand that as a participant in this study the following things will happen:
1. **Pre-participant Selection.** I understand that I have been identified as a participant during some portion of the CAL project. The researchers used this information to select me as a participant in this study by participating in an observed meeting or in an interview.
 2. **Observations.** Joe Dunlap will observe the meeting. I understand that he will observe and record the dynamics of a meeting, which I will attend and participate. The information obtained will be used to identify relationships between organizations participating in the CAL, and to identify key issues and important decision points in the design, development, or implementation processes associated with the CAL life cycle. The meeting will not be audio taped and you will not be identified by name in the data collected.

Interview Process. Joe Dunlap will conduct the interview. I understand that he will ask me a variety of questions about my participation and experiences in the CAL project in Gresham, Oregon. The questions will be determined from information gathered during a literature review on private sector-educational partnerships, educational reform, and systems thinking. The interview will take up to one hour and will be scheduled at my convenience. It is possible that I will be contacted for follow-up information to be conducted on the phone or in person. The interview will be audiotape recorded unless I request that it not be. I may request at any time to stop the tape, and it will be stopped. I may request at any time to end the interview and it will be ended. I may choose not to answer any questions that I wish.

3. **Foreseeable risks or benefits.** There are no foreseeable risks or direct personal benefits.
4. **Confidentiality.** Any information obtained from me will be anonymous. If I was interviewed and audio taped, Joe Dunlap or a paid typist will transcribe the tape recording. I will be identified by a pseudonym in the transcript of my interview as well as in any reports or presentations on the study; my real name will not appear anywhere but this document. I may give written permission to allow the name of my organization to be used in association with my comments. The only persons who will have access to the study's audiotapes and transcripts will be the investigators. The audiotapes of the interviews will be erased and then destroyed when the study has been completed. Paper copies of the transcript of the interview will be destroyed and digital copies will be deleted/erased when the study has been completed.

- E. **Voluntary Participation Statement.** I understand that my participation in this study is completely voluntary and is no way required by the Center for Advanced Learning, my organization, or any other entity. I may either refuse to participate or withdraw from the study at any time without penalty or loss of benefit to which I might otherwise be entitled. I understand that if I withdraw from the study before it is completed all information that I have individually provided will be destroyed.
- F. **If I Have Questions.** I understand that any questions I have about the research study or specific procedures should be directed to Joseph Dunlap at 503-491-7365 or Dr. Sam Stern 541-737-6392. If I have questions about my rights as a research subject, I should call the IRB Coordinator, OSU Research Office, 541-737-3437.

My signature below indicates that I have read and that I understand the procedures described above, and gives my informed and voluntary consent to participate in this study. I understand that I will receive a signed copy of this consent form.

Signature of participant

Date signed

Participant's printed or typed name

Address

Phone number(s)

APPENDIX D**CAL PERMISSION LETTER**

*Gresham-Barlow School District
1331 NW Eastman Parkway
Gresham Oregon 97030*

November 15, 2001

Office of Research
Institution Review Board Coordinator
Oregon State University
Corvallis, OR 97331

To Whom It May Concern:

Joseph Dunlap, a doctoral student at OSU, has requested permission to access all documents, data, meetings, and personnel associated with the design, development and implementation processes of the Center for Advanced Learning. Joe will be doing his doctoral dissertation, Education-Private Sector Partnerships at the Center for Advanced Learning: A Regional Educational Reform Initiative, to gain a better understanding of the dynamics of education-private sector partnerships that have emerged during the life-cycle of the Center for Advanced Learning project.

As the Project Manager for the Center for Advanced Learning I agree to provide 1) Joseph Dunlap and Dr. Sam Stern, Joe's major professor, access to attend and observe all design, development and implementation meetings, 2) to provide names of all education, private-sector and governmental agency representatives who participated in the project thus far, and 3) to provide access to electronic and paper copies of all documents relating to the design, development, and implementation of the Center for Advanced Learning.

Sincerely,

James Buck
Assistant Superintendent
Gresham-Barlow School District

APPENDIX E
BYLAWS
OF
CENTER FOR ADVANCED LEARNING

ARTICLE 1
Purposes And Powers

1.1 Purposes. The primary purposes of the Corporation are to provide education services and support for students attending the Center for Advanced Learning. The Corporation is organized and shall be operated exclusively for educational, charitable or scientific purposes within the meaning of Section 501(c)(3) of the Tax Code.

1.2 Powers. Subject to the express limitations and restrictions contained in this Article 1 and in Article 2 below, the Corporation may engage in any lawful activity for which corporations may be organized under the Act.

ARTICLE 2
Restrictions

2.1 No Private Inurement/Benefit. No part of the net earnings of the Corporation shall inure to the benefit of, or distributable to, its Directors, officers, or other private persons, except that the Corporation may pay reasonable compensation for services rendered and may make payments and distributions in furtherance of its purposes.

2.2 Lobbying/Political Campaign Restrictions. No substantial part of the activities of the Corporation shall consist of carrying on propaganda or otherwise attempting to influence legislation, except to the extent permissible under Section 501(b) of the Tax Code.

2.3 Other Restrictions. The Corporation shall not carry on any other activities not permitted to be carried on by (a) a corporation exempt from federal income tax under Section 501(c)(3) of the Tax Code, or (b) a corporation to which contributions are deductible under Section 170(c)(2) of the Tax Code.

ARTICLE 3

Board of Directors

3.1 Duties of the Board of Directors. The business affairs of the corporation shall be managed by the Center for Advanced Learning Board of Directors hereafter referred to as Board of Directors.

3.2 Number, Term and Selection. The number of directors shall be between three (3) and seven (7) as determined by the Board of Directors, each of whom will serve for a period of three (3) years and/or until their successors are appointed.

3.3 Election. Election of new directors or election of current directors to succeeding terms will occur in a meeting convened by the three district (Centennial, Gresham-Barlow and Reynolds school district) superintendents in March of each year. The term of office shall begin in July unless otherwise determined by the Board.

3.4 Nominating Committee. The superintendents shall use a Nominating Committee to identify and recruit qualified persons to serve as directors.

3.5 Qualifications. Four Directors will be selected so there is a director representing each of the three school districts and Mt. Hood Community College. These directors must reside in the attendance area of the district or college they represent. Remaining directors will be selected from members of the community at-large committed to providing a high quality educational program for high school students. Other director qualifications shall be determined by the Board of Directors.

3.6 Vacancies. If a director dies, resigns or is removed, the superintendents shall appoint a director to serve for the duration of the unexpired term.

3.7 Removal. Any director may be removed from the Board of Directors by the unanimous decision of the district superintendents. Directors shall receive notice and be entitled to attend any meeting of the superintendents where removal of a director is to be considered. The director involved will be given an opportunity to be present and to be heard at the meeting in which his or her removal is considered.

3.8 Compensation. No compensation will be paid to any director for services as a director.

ARTICLE 4
Meetings of the Board of Directors

4.1 Annual and Regular Meetings. An annual meeting of the Board of Directors will be held in January of each year. In addition to the annual meeting, the Board of Directors will hold regular meetings at least three (3) times each calendar year at such place as may be designated in the notice of the meeting.

4.2 Notice. Directions will be notified at least seven days prior to the day such meetings are to be held.

4.3 Special Meetings. Special meetings of the Board of Directors may be called at any time by the Chair of the Board or upon receipt of a request signed by three or more directors. Directors will be notified of special meetings at least two days prior to the day such meeting is to be held.

4.4 Waiver of Notice. A director may at any time waive any notice required by law, the Articles of Incorporation of these Bylaws. Unless a director attends or participates in a meeting, a waiver must be in writing, must be signed by the director entitled to notice, must specify the meeting for which notice is waived and must be filed with the minutes or corporate records.

4.5 Quorum. The presence of a majority of the directors will constitute a quorum at any meeting.

4.6 Vote. A vote of the majority of the directors present at a meeting is required to pass a motion before the Board.

4.7 Telephonic Meetings. Members of the Board of Directors may hold a board meeting by conference telephone or similar communications equipment by means of which all persons participating in the meeting can hear each other. Participation in such a meeting shall constitute presence in person at the meeting.

4.8 Action Without Meeting. Any action that is required or permitted to be taken by the directors at a meeting may be taken without a meeting if a consent in writing setting forth the action so taken shall be signed by all of the directors entitled to vote on the matter. The action shall be effective on the date when the last signature is placed on the consent or at such earlier or later time as is set forth therein. Such consent, which shall have the same effect as a unanimous vote of the directors, shall be filed with the minutes of the Corporation.

ARTICLE 5
Officers of the Corporation

5.1 Enumeration. The officers of the Corporation will be the Center for Advanced Learning Director, the Treasurer who will be the Chief Financial Officer for Gresham-Barlow School District and the Chair of the Center for Advanced Learning Board of Directors.

5.2 Term for Officers. The officers of the Corporation will serve as long as they hold their respective positions at the Center, school district, or on the Board of Directors.

5.3 Removal. An officer can be removed only through a majority vote by the district superintendents and the Board of Directors.

5.4 Vacancies. A vacancy in any office shall be filled by the Board of Directors.

5.5 Director. The Director shall be responsible for calling all meetings of the Board and determining who facilitates all meetings.

5.6 Board Chair. The Board Chair shall be responsible for preparing minutes of the meetings and for authenticating records of the Corporation; seeing that all notices are duly given in accordance with these Bylaws; maintaining all Corporate records; verifying election results; and performing all duties incident to the office of Board Chair and such other duties as from time to time may be assigned by the Board of Directors.

5.7 Treasurer. The Treasurer shall be the chief financial officer of the Gresham-Barlow School District; oversee the receipt and disbursement of funds; report to the Board and the members on the financial condition of the Corporation, including a report for each regular meeting of the Board of Directors and a yearly summary report; and shall perform all duties incident to the office of Treasurer is responsible for maintaining a record of all income, including but not limited to, gifts, grants, contributions, gross receipts from performance of services or furnishing of facilities by the Corporation, and the sources of such income.

5.8 Salaries. The salaries of the officers, excluding the board chairperson who is uncompensated, shall be fixed by the Board of Directors and reviewed for readjustment annually.

ARTICLE 6

Committees

Committees may be established or abolished upon the Board of Director's evaluation of the Corporation's resources and goals. Committee members may be members of the Board of Directors or other interested parties. The Committee shall designate and the Board shall approve, a liaison to the Board of Directors, who is responsible for maintaining accountability of the Committee to the Board. The studies, findings and recommendations of all committees will be reported to the Board of Directors for consideration and action, except as otherwise ordered by the Board of Directors. Committees may adopt such rules for the conduct of business as are appropriate and as are not inconsistent with these Bylaws, Articles of Incorporation or federal, state or local law..

ARTICLE 7

Miscellaneous Provisions

7.1 Authority to Contract and Execute Instruments. The Board of Directors may authorize any officer or officers, agent or agents of the Corporation in addition to the officers so authorized by these Bylaws, to enter into any contract or execute and deliver instruments in the name of, and on behalf of, the Corporation. Such authority may be general or confined to specific instances.

7.2 Signing Checks and Like Instruments. All checks, drafts and other orders for payment of funds will be signed by such officers or such other persons as the Board of Directors may from time to time designate.

7.3 Record Keeping. The Corporation will keep correct and complete books and records of accounts, and will also keep minutes of the proceedings of its Board of Directors.

7.4 Fiscal Year. The fiscal year of the Corporation will be from July 1 through June 30.

7.5 Severability. Any determination that any provision of these Bylaws is for any reason inapplicable, invalid, illegal or otherwise ineffective shall not affect or invalidate any other provision of these Bylaws.

ARTICLE 8
Amendments

These Bylaws may be altered, amended or repealed and new Bylaws may be adopted by the Board.

CERTIFICATE OF BOARD CHAIR
CENTER FOR ADVANCED LEARNING

The undersigned, being the duly appointed Board Chair of the Center for Advanced Learning (the "Corporation") does hereby certify that the foregoing Bylaws have been duly adopted by the Corporation's Board of Directors as the Bylaws of the Corporation.

IN WITNESS WHEREOF, the undersigned has executed this Certificate to be effective on the _____ day of _____, 2002.

Name
Title

APPENDIX F
2002 RESTATED
ARTICLES OF INCORPORATION
OF
CENTER FOR ADVANCED LEARNING

CENTER FOR ADVANCED LEARNING (the "Corporation") adopts the following 2002 Restated Articles of Incorporation, which shall supersede the heretofore existing Articles of Incorporation and all previous amendments and restatements, if any:

ARTICLE 1. Name and Duration

The name of the Corporation is CENTER FOR ADVANCED LEARNING and its duration shall be perpetual.

ARTICLE 2. Purposes and Powers

2.1 The Corporation is a public benefit corporation within the meaning of the Oregon Nonprofit Corporation Act, as amended, or any successor statute (the "Act").

2.2 The Corporation is organized and shall be operated exclusively for charitable purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code of 1986, as amended, or any successor statute (the "Tax Code").

2.3 Subject to the express limitations and restrictions contained in this Article 2 and in Article 3 below, the Corporation may engage in any lawful activity for which Corporations may be organized under the Act.

ARTICLE 3. Restrictions

3.1 No part of the net earnings of the Corporation shall inure to the benefit of, or be distributable to, its directors, officers, or other private persons, except that the Corporation may pay reasonable compensation for services rendered and may make payments and distributions in furtherance of its purposes.

3.2 No substantial part of the activities of the Corporation shall consist of carrying on propaganda or otherwise attempting to influence legislation, except

to the extent permissible under Section 501(h) of the Tax Code. The Corporation shall not participate in, or intervene in (including the publishing or distributing of statements), any political campaign on behalf of (or in opposition to) any candidate for public office.

3.3 The Corporation shall not carry on any other activities not permitted to be carried on by (a) a corporation exempt from federal income tax under Section 501(c)(3) of the Tax Code, or (b) a corporation to which contributions are deductible under Section 170(c)(2) of the Tax Code.

ARTICLE 4. Dissolution

Upon the dissolution or final liquidation of the Corporation, after paying or making provision for the payment of all the liabilities and obligations of the Corporation, the Corporation's remaining assets shall be distributed to the Oregon Department of Education as legally obligated or to the Centennial, Gresham-Barlow and Reynolds school districts or to such other tax exempt organization or organizations described in Section 501(c)(3) of the Tax Code as the Board of Directors shall determine.

ARTICLE 5. Board of Directors

The business affairs of the Corporation shall be managed by a Board of Directors.

ARTICLE 6. No Members

The Corporation shall not have members, as that term is defined in the Act.

ARTICLE 7. Director and Uncompensated Officer Liability

No director or uncompensated officer of the Corporation shall be personally liable to the Corporation for monetary damages for conduct as a director or officer; provided this article shall not eliminate liability of a director or uncompensated officer for any act or omission for which such elimination of liability is not permitted under Oregon law. No amendment to or repeal of this article shall apply to or have any effect on the liability of any director or uncompensated officer of the Corporation for any act or omission that occurs prior to the effective date of any such amendment or repeal. No amendment to Oregon law that further limits the acts or omissions for which elimination of liability is permitted shall affect the liability of a director or uncompensated officer for any act or omission that occurs prior to the effective date of such amendment.

ARTICLE 8. Registered Office and Agent

The address, including street and number, of the registered office of the Corporation is:

CENTER FOR ADVANCED LEARNING
Address
Gresham, Oregon

and the name of the registered agent at that address is _____.

ARTICLE 9. Mailing Address

The mailing address of the Corporation is:

CENTER FOR ADVANCED LEARNING
c/o Gresham-Barlow School District
1331 NW Eastman Parkway
Gresham, OR 97030

DATED this _____ day of _____, 2002

CENTER FOR ADVANCED LEARNING

By: _____
Name
Title

Person to contact about this filing:

Name
Phone