LEGITIMATION OF APPLIED KNOWLEDGE:
THE CREATION OF A BACHELOR OF TECHNOLOGY DEGREE AT BCIT

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Abstract

This thesis documents and analyses a process whereby practice-based applied knowledge achieved formal legitimacy in British Columbia. The study is a historical case study representing a unique case, the creation of a Bachelor of Technology degree at the British Columbia Institute of Technology (BCIT). The central research question is: What were the external and internal factors that enabled or constrained the legitimation of applied knowledge to baccalaureate status at BCIT?

The study is situated within both a theoretical and comparative context. The theoretical framework recognises the changing base of knowledge through discussion of pure and applied knowledge, knowledge stratification and its overt expression in terms of educational credentials, and the demarcation of knowledge units. A comparative backdrop to the study traces the legitimation of applied knowledge in the United Kingdom, Germany, Australia and Canada.

Methods of investigation included: interviews with stakeholders representing government, the corporate sector, professional associations, and BCIT personnel, past and present; analysis of archival materials and contemporary policy documents; and, participant observation resulting from the author’s intimate involvement with the process.

The study concludes that this new level of legitimacy conferred on applied knowledge in British Columbia results from the convergence of factors both external and internal to BCIT, the integrative factor being "timing." Practice-based applied knowledge was elevated to baccalaureate status for the following reasons: the proposal for a Bachelor of Technology degree aligned with government’s vision; government had confidence in BCIT as a degree
granting institution; the political environment was “safe”; and, the approach was cost effective and accountable. Constraining factors pertained primarily to the effects of degree granting on BCIT’s valued diploma programs. Future research could investigate the impact of degree status on the diploma programs and on the overall culture of the institution.
Legitimation of Applied Knowledge

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To my children, Scott, Sian, Ryan and Rhys, who “lost” their mother during this process — life begins again.
Chapter One:
Overview of the Thesis
In January 1995, the government of British Columbia enacted legislation giving degree granting status to selected post-secondary institutions in the non-university sector. This legislation not only removed the degree granting monopoly from the universities but it also legalised a trend to place more emphasis on applied education. It heralded what may be considered a major shift in baccalaureate education as practice-based applied education was awarded formal parity with traditional academic education. Historically, a hierarchy has existed within our education system drawn along divisions of social class and the social status of knowledge. Applied knowledge, specifically practice-based technological knowledge, has assumed a lower place in that hierarchy.

In contrast to other industrialised societies, recognition of technological education in British Columbia traditionally has been restricted to the pre-degree level. The formalisation of practice-based applied knowledge into a baccalaureate degree has conferred a new and unprecedented level of legitimacy on this and on the institution offering such knowledge. This represents the latest gain by proponents of applied knowledge in an ongoing struggle for "acceptability" and "respectability." The history of higher education embodies a continuous tension between pure and applied knowledge. In medieval universities, the applied subjects of medicine, law, and dictamen were regarded as the natural enemies of literary humanism. An advancing culture of professionalism which sought to legitimise applied science, engineering and commerce in response to industrial needs in nineteenth century Europe, was constrained by the desire for social status associated with a liberal education. Historically, the esteem of applied knowledge in the university sector has been economically driven, responding to vocational needs rather than an educational ideal.
Currently, educational change is once again being driven by political and economic imperatives. An expanding knowledge based economy, globalization and demographic shifts, coupled with increased international competition and rapid technological change, have resulted in the creation of new occupational clusters, organisational structures and labour market opportunities that require different qualifications and skills. In British Columbia, there is concern that the present education system is not producing a workforce with knowledge and skills appropriate to current needs (MAETT, 1991a; BCLFDB, 1995; Gallagher, Sweet, and Rollins, 1997). As in other jurisdictions, British Columbia's education system is under review and reconstruction. Increasingly, higher education is being called on to acknowledge and value its vocational role, not only to equip its graduates with theoretical knowledge, but also with the practical competencies to apply that knowledge.

The Study

Purpose of The Study

The purpose of this study is to document and analyse one process whereby applied knowledge becomes legitimate. The case will be the creation of a Bachelor of Technology Degree at the British Columbia Institute of Technology (BCIT).

Limitation of the Study

Whereas the term applied knowledge refers equally well to vocational training, to the professions, for example, medicine, dentistry and to university studies such as engineering and commerce, this study will be limited to the recognition of applied knowledge as it refers to practice-based, technological knowledge to the baccalaureate level. The study will employ
case study methodology using the creation of a Bachelor of Technology degree at BCIT as the unit of analysis.

**Research Questions**

What were the external factors that enabled or constrained the legitimation of applied knowledge to baccalaureate status at BCIT? This question will be examined from a national, provincial and local perspective and will incorporate evidence of the social and economic trends, and political initiatives.

What were the internal factors that enabled or constrained the legitimation of applied knowledge to baccalaureate status at BCIT? This question will examine such issues as the need to be competitive, the viability of the institution, the needs of graduates, the impact upon the diploma, the views of faculty.

**Significance of the Study**

Awarding of degree granting status to selected institutions in British Columbia's non-university sector represents a major development in post-secondary education in British Columbia. This was possibly the most significant turning point in the history of these institutions since their emergence in the late 1960s. The legitimation of applied knowledge at BCIT represents part of a general trend throughout the province and in other parts of Canada to recognise practice-based technological knowledge to baccalaureate level.

The study will provide a historical perspective on the development of technological knowledge in British Columbia. It will attempt to show how the convergence of economic, political and social agendas brought about educational change that not only overcame
academic barriers but also traditional social barriers. These developments will be set within a comparative context. Comparisons of the evolution of practice-based degrees in British Columbia with other jurisdictions having more established systems of practice-based technological degrees may afford insights into potential future directions and issues along with consequences, which may present themselves as this new educational approach matures in British Columbia.

**Terminology**

The spectrum of applied knowledge ranges from the predominantly practical to the very theoretical aspects. Educational patterns in British Columbia in the late 1950s suggested four levels of preparation: unskilled labour; semi skilled labour; tradesman or journeyman; and professional (Bridge, 1960). The universities supplied theoretically focused professional education while vocational schools provided training for the semi skilled, tradesman and journeyman. A bifurcated system existed, supplying only the extremes of the applied knowledge spectrum. Prior to the 1960s, in British Columbia the role of bridging the gap between theory and practice had belonged to an applied science graduate, however the explosion of technological knowledge widened this gap to such an extent that it required more than one category of worker. Since applied scientists must keep pace with the theoretician, a more practice-based worker was required to bridge the gap to the practitioner. The technologist evolved to fill this middle category. It is in this middle category where the confusion of terminology is most apparent. This study will differentiate between professional, technical/technological and vocational levels of applied education using the following operational descriptions.
Chapter One: Overview of the Thesis

Professional Education

Professional education is university education recognised by a baccalaureate degree at the undergraduate level and to advanced degrees at the graduate level or equivalent professional qualifications. The objective of professional schools is to educate in an organised body of theory and relate subject matter fundamental to the practice of the profession (Roper, 1965). Professional education involves study of the theoretical principles which underpin the applied aspects of the profession. The main function of a professional is to formulate new ideas, to supervise, to do research, to accept a high degree of responsibility and to push forward the boundaries in his own particular field through the application of scientific knowledge and method in the workplace.

Vocational Education

In Europe the term vocational spans all forms of employment oriented education. In British Columbia it has a narrower focus, referring to education in the trades or vocational schools to produce semi-skilled labour, tradespersons and journeypersons. This study adopts this narrower definition. Vocational education refers to education or training usually in a single specific skill or task, producing skilled practitioners or craftspersons, through apprenticeships or certificate programs. Tradespersons and journeypersons typically concentrate on manual skills to produce a finished product.

Technical/Technological Education

The literature makes indiscriminate and often interchangeable use of the terms technical and technological and related terms technician and technologist. Specifically, the Bridge Report (1960) uses the terms loosely and refers to the product of an institute of technology as a technician. Roper (1965) describes this same product as a technologist. This lack of
distinction may well be explained by the fact that in the early 1960s the technical category of worker was new and not well understood in British Columbia (Bridge, 1960). Explosive growth in technological information and consequent broadening of the applied knowledge spectrum resulted in a hierarchy appearing within the middle category of the spectrum delineating respective positions for a technologist and a technician. In 1980, the Society of Engineering Technologists of British Columbia identified technician training as a one year certificate program whereas a technologist was the graduate of a two year diploma program.

The focus of this study is on technological education and adopts the operational definition of a technologist as a graduate of a two year Diploma of Technology program involving approximately 2400 of hours of study.

Traditionally, universities set out to produce critical minds; vocational schools were designed to produce skilled people. Our society is in need of the combination — a need that is served for the most part by the institutes of technology providing technological education.¹

Technologists have both a practical and theoretical training orientation, however in contrast to professionals, the technologist is more concerned with the practical application of established theory and principles than with the development of the principles themselves. While they understand basic scientific principles, technologists are proficient in mathematics and science to the extent required to equip them to understand and apply principles in their chosen field. Comparatively, the technologist and the technician undergo both theoretical and practical training, however the focus of the technologist is more theoretical, concentrating on increasing knowledge of fundamental principles that underlie design, whereas the technician's work is more manual and fills a position between the technologist and the practitioner, the skilled craftsperson.
Career/Technical Education

The term career/technical is a contemporary term used to refer collectively to applied programs of one or two years duration at colleges and institutes. This study adopts this definition.

Legitimation

This study defines "legitimation" of applied knowledge as recognition of practice-based technological knowledge to the baccalaureate level, namely legitimation by the state.

However Moran (1991), in her study of the Open University asserts:

"To survive and prosper a new higher education institution must necessarily establish its identity, credibility and status with peers and sponsors, and its popularity in the marketplace — in short, its legitimacy. A legal mandate, alone, cannot guarantee this legitimacy.....It is a struggle to earn respect for the intellectual quality and standards of teaching and research, to fend off competition, and to reach levels of funding and enrolment popularity guaranteeing not only survival but also prestige and stature, (p.1)."

BCIT is not a new higher education institution, however it is a new degree granting institution.

This study reveals that legitimation of non-traditional baccalaureate education translates into establishing institutional legitimacy and adopts the model of institutional legitimacy developed in the study by Moran (1991). Both studies investigate the legitimation of unconventional educational pedagogues and unusual organisational structures. Moran recognised such legitimation involved legitimising the institution. This is confirmed in the findings of this current study. Both studies address the question of legitimation through a social history of the respective institution. Moran (1991) assigns three broad interconnected dimensions to institutional legitimacy: vertical hierarchies of institutions, curricula and
pedagogues; horizontal status within institutional sectors and fields of knowledge; and external legitimacy in relation to the state (p.2). Institutional legitimacy is closely related to the purposes of higher education and while the liberal versus utilitarian functions has been an ongoing matter of debate, modern conflicts have been fuelled by increasing state demands for relevance of higher education to economic and social agendas. Institutional legitimacy has both objective and subjective aspects (Trow, 1984). Objective legitimacy is primarily determined by the state in terms of legal status, formal rights, privileges and limitations. These criteria demarcate the various sectors of higher education and are reflected in institutional mandates and resource allocation. Subjective legitimacy occurs inherently through institutional comparisons based on criteria traditionally associated with the universities.

Moran (1991) questions who confers institutional legitimacy, and ascribes this to three broad groups. One group is the institution's clientele, its students, employers and sponsors. Student choice of institution reflects both the prestige of the institution and its responsiveness to their particular needs, whereas employers assess the institution through the employability of its graduates. A second group is other institutions and individuals in the higher education community, locally, provincially, nationally and internationally. The third group comprises of government officials, specifically those in education and affiliated ministries, whose interests stem from provision of resources to furtherance of economic and social policy (p.3).

While higher education systems vary between nations, evidence of institutional hierarchies is common and has tended to reproduce social values and reinforce social stratification (Bourdieu, 1977; Aronwitz and Giroux, 1985). For example, the British university system exhibits a hierarchial structure with Oxbridge, the civic universities and polytechnic
universities in descending order. This model supports three of Moran’s (1991) assertions. First, that institutional age is an important subjective indicator of legitimacy (p.3), as age enables traditions and loyalties to develop and be handed down through generations of families reinforcing social stratification and reproducing social culture and values. Second, that hierarchial legitimacy also stems from the relative prestige accorded types and levels of knowledge. For example, the historically higher status of liberal over vocational education. Third, that access to higher education is an important facet of hierarchial legitimacy, the perception being, the more stringent the admission criteria, the more desirable the institution or program. In general, universities have used restrictive entry practices to demarcate the high status professional programs. The question of access is fundamental to the debate on mass versus elite education. Institutional attitude towards this controversy may well influence stakeholder opinion as to the hierarchial position of the institution.

Moran (1991) refers to the horizontal dimension of legitimacy as “an institution’s credibility and stature in the eyes of peer institutions and disciplinary practitioners” (p.4). Institutional mandates determine the peer status of institutions. A degree granting technical institute with an applied research mandate has commonalities with universities, colleges, other technical institutions and industry sectors and is judged by a specific peer group against normative criteria depicting their common culture. Horizontal legitimacy also occurs at the program/discipline level and on an individual level between faculty associated with a particular knowledge field.

Institutional legitimation by the state is key to the survival of the institution and is manifested in terms of financial allocation, institutional mandate and degree of autonomy afforded the institution. State legitimation may be influenced by contemporary economic and social
policies and the extent to which the institution or field of knowledge can further the political agendas. Currently higher education has dual responsibilities, both to produce a skilled workforce and to preserve social and cultural norms. Increasing emphasis on occupationally relevant education may boost state legitimation of institutions perceived to be focusing on this role.

Outline of the Study

Following this chapter, Chapter Two reviews the literature pertaining to the study. The first section provides the research context and includes discussion of pure and applied knowledge, the stratification of knowledge, the demarcation of knowledge and the concept of boundary work, and the legitimation of knowledge through credentialing. The second part provides a comparative context by tracing the legitimation of applied knowledge in the United Kingdom, Germany, Australia and Canada. Chapter Three outlines the methodology of the study. The research design primarily follows a case study methodology but adds some historiographical techniques. Additionally, the chapter describes the research site, data collection and analysis, and the validity and reliability of the study. Interviews are identified as the primary data source and rationale for participant inclusion is detailed. Chapter Four gives a historical overview of the various types of post-secondary institutions in British Columbia and their contributions to applied knowledge. The chapter reveals a polarised system prior to the 1960s and provides a context for situating a technical institution within British Columbia’s post-secondary environment. Chapter Five presents a social history of BCIT from its conceptualisation in the early 1960s to its legitimation as a degree granting institution in the mid 1990s. Chapter Six focuses directly on the subject of this study, degree granting at BCIT, embellishing that part of BCIT’s history introduced in Chapter Five. The chapter first traces events that culminated in an unsuccessful bid for degree granting status in
the early 1980s. Identification of BCIT as a market driven institution then provides a context for discussion of BCIT's strategic approach to degree granting in the 1990s. Major steps in this process are described, specifically the preparation of a Discussion Paper and subsequent Proposal. Chapter Seven presents the findings of the study. The chapter interweaves analysis with narrative as it discusses the external and internal factors that enabled and constrained the creation of a Bachelor of Technology degree at BCIT. Chapter Eight presents the conclusions of the study.

Footnotes

Chapter Two: Review of the Literature
This chapter reviews the literature pertaining to the study and consists of two distinct themes: Knowledge, and Trends in Other Jurisdictions. The former provides the research context and includes four parts: discussions of pure and applied knowledge; the stratification of knowledge and the relationship between power and knowledge; the demarcation of knowledge and the concept of boundary work; and, the legitimation of knowledge through credentialing. The latter sets the study in a comparative context through an overview of the evolution of practice-based technological degrees in the United Kingdom, Germany, Australia, and Canada.

**Part One: Knowledge**

**Pure and Applied Knowledge**

**Terminology**

Knowledge is frequently referred to, and to some extent categorised, using terms “pure” and “applied” or “academic” and “vocational,” yet these terms lack definition. Meanings vary among national cultures and systems, however, broadly speaking academic refers to study programs which are discipline centred, whereas vocational programs are designed to fit specific occupational clusters, and involve a strong component of functionalism (Jallade, 1992). A parallelism is seen with the definition of vocational training by Fisher et al. (1994) as “the development of specific abilities or the competence to perform certain tasks” (p.x). Fisher et al. (1994) contrast vocational training with education, described as the formal process of developing knowledge, the mind and one’s character. Wilkinson (1980) distinguishes between pure and applied knowledge by contrasting science, defined as an examination of the natural laws governing the environment, and technology which, he says,
occurs when “man” attempts to use these laws to control the environment. Hence the aim of professional schools, be they in universities or other institutions, is to graduate technologists. Wilkinson (1980) suggests that a university based vocational education generally affords a theoretical foundation with applications following graduation, whereas a technical institution emphasises applied education throughout. Moreover, he contends that the hierarchial role placing technology in a subservient role to science is no longer acceptable.

Jallade (1992) alludes to the concepts of pure and applied knowledge in his use of the terms “essentialism” and “vocationalism” when illustrating the existence of two cultures in higher education. Jallade cites Kogan’s (1992) interpretation of essentialism, meaning higher education should regard the training of the independent minds as its main task; whereas he uses vocationalism as a “catch-all” word which delineates the gradual subordination of academic traditions to vocational training in response to external economic and social objectives. Encel (1965), infers pure and applied knowledge as he contrasts the “cultural” and “instrumental” views of education. The cultural view “takes education, and especially higher education to be an end in itself” (p.2), whereas the instrumentalist view harnesses education to societal needs. Silver (1980) differentiates between pure and applied knowledge using the terms “useless knowledge” to refer to the classical curriculum sought by the eighteenth-century gentlemen (p.115) and “useful knowledge” defining “areas of ‘fact’ or principle that would be useful to working men in their occupations” (p.120).

**Pure versus Applied Knowledge**

Contemporary argument suggests that the traditional university dogma of knowledge for its own sake is being eroded in search of the holy grail of relevance. Debate rages over the vocational role of the university. Yet the universities themselves were born of this need.
Differentiation

The tension between “pure” and “applied” knowledge is part of the historical foundation of university education. The Greeks embraced a liberal ideology:

Then let us not leave the meaning of education ambiguous or ill-defined ... For we are not speaking of education in this narrow sense, but of that other education in virtue from youth upwards, which makes a man eagerly pursue the ideal perfection of citizenship, and teaches him how rightly to rule and obey ... that other sort of training, which aims at the acquisition of wealth or bodily strength, or mere cleverness, apart from intelligence and justice, is mean and illiberal, and it is not worthy to be called education at all. Dialogues of Plato (cited in Jowett, 1892, p.22).

The transition from Greek to Graeco-Roman and early medieval education was characterised by an increasing emphasis on educational utility (Cobban, 1975), geared towards service to the state. The utilitarian focus of Roman education was subsequently transmitted to the Christian schools, and education was “reduced to its bare bones” (Cobban, 1975 p.6) to meet the basic requirements of a literate priesthood. A humanistic revival in the eleventh and twelfth centuries and an attempt to return educational values to those of intellectual and moral excellence embodied by Cicero was suppressed by utilitarian pressures of society. According to Cobban, however, this “humanistic tide was arrested and fragmented” (p.8) and the emerging universities evolved “as institutional responses to the pressures to harness educational forces to the professional, ecclesiastical and governmental requirements of society” (p.8). The roots of the universities were bound up in utilitarian values. Their origin was economic. They evolved not as an educational ideal but at a time when corporate growth in west European society necessitated permanent centres of higher education capable of producing talent for socially useful employment (Cobban, 1975). Perkins (1984), contrasting universities with professional training schools acknowledges the dualism of the university. He points out that advanced professional courses were preceded by a common curriculum in the seven liberal arts. The latter consisted of the “trivium” — grammar, logic and rhetoric —
the basic tools of further study, and the “quadrivium” — arithmetic, geometry, astronomy and music — the foundations of natural science. For Perkins the arts faculty, as it became, was no less utilitarian or vocational than the professional faculties as it provided training in “literacy, logical argument, persuasive reasoning, computation, mensuration and the elements of observational science” (p.25). While the seven liberal arts formed the theoretical basis for a utilitarian medieval education, the Renaissance marked a resurgence of classical education as an end in itself, as the focus of universities shifted to cater for the educational needs of the ruling elite.

Wilkinson (1980) endorses a dichotomy in his description of the initial purpose of Oxford and Cambridge as two fold: first, as a professional school for medicine, law, government and the church; and second, as a finishing school for the elite, reflecting the on going debate on the liberal versus utilitarian function of the university. Edgworth (1809), in his Essays on Professional Education, attacks contemporary university studies and states that “the value of all education must be ultimately decided by its utility” (Sanderson, 1991, p.43). Coppleston (1810), Provost of Oriel College, Oxford in his defence of liberal education, refutes this argument on two grounds: by claiming that “by fitting a man for no particular purpose thereby fitted him for all of them”; and by making a distinction between ends and means (Sanderson, 1991, p.43). This latter justification was echoed by Newman (1959) who states that “knowledge is capable of being its own end....and that any kind of knowledge if it be really such, is its own reward” (p.130). German idealists in the nineteenth century reinforced the concept of the theoretical unity of knowledge advocating devotion “to pure scholarship and to general education or ‘cultivation’ (Bildung), defined as the full development of a student’s mind, spirit and character” (Ringer, 1979, p.35). Taylor (1981) alludes to the inherited conflict between Bildung (self cultivation) and Ausbildung (professional training)
and suggests that the ambivalence displayed by the Germans is reflected in the nation's attitude towards transition from a craft-based economy to an industrialised society. The expansion of the university sector in the late nineteenth century begs a paradoxical question: did the economic need for applied knowledge provide a raison d'être for universities created during this expansion period, or did the universities, by offering vocational education, legitimise applied knowledge?

**Convergence**

Convergence of the liberal versus utilitarian function of higher education is evident in a contemporary study by Brown and Scase (1994) who determined that “the personal qualities previously associated with the elite forms of higher education are now increasingly appropriate for a broader range of employees, including middle managerial, technical specialist and those skilled in managerial occupations” (p.11). Dertouzos et. al (1990) contend that, historically, institutions have subscribed to their differentiated roles. Both traditional universities and technical institutions have shared Mathew Arnold’s perception that “coal, iron and railroads have nothing to do with sweetness and light” (p.156). According to Dertouzos, both institutions must now prepare graduates for an increasingly complex world whose “doors cannot be opened with old-fashioned keys labelled ‘technologist’ or ‘humanist’” (p.156). Attempts to bridge the two cultures is evident. On the one hand the traditional universities seek legitimation in the eyes of society through vocationalism as they “struggle to fit new science and technology into the body of their old learning” (Dertouzos et al., 1990). On the other hand technical institutions seek legitimation through integration of “academic” liberal studies into technical programs.
Universities have responded to their vocational role both through program initiatives geared to preparing students for changing labour market demand, for example, co-operative education, continuing studies and distance education, and through increased collaboratives across academic/industry boundaries (Fisher et al., 1994). Grosjean (1997) sees an increase in vocationalism as universities compete to provide training of highly skilled technical employees. Co-operative education was introduced into Canadian higher education at the University of Waterloo in 1957. Simon Fraser University and the University of Victoria's implemented co-operative education programs in 1975 and currently offer co-op opportunities in most faculties. The University of British Columbia adopting co-operative education in 1992 limited it to applied sciences (Fisher et al., 1994). Growth of co-operative education programs recognises the benefits of “real-world, hands-on” experience (Dertouzos et al., 1990) and the claim that relevant work experience leads to improved academic performance (Fisher et al., 1994). Moreover, it provides a vehicle of reciprocal technology transfer between industry and the academy.

Continuing studies have traditionally been marginalised by the university with tensions and conflict characterising the university/continuing education boundary. However, a rapidly changing scientific and technological environment, requiring university-trained professionals to update their conceptual and practical knowledge base continuously to avoid “professional obsolescence,” has resulted in a re-evaluation of the university’s role in continuing education. According to Grosjean (1997), “at stake is the permeability of the boundary that has traditionally separated the university’s education and training function” (p.1). Continuing studies have been developed at all three British Columbia universities, albeit with different foci and structures. Fisher et al., (1994) refer to “centralised” or “decentralised” model of Continuing Studies to indicate their integration with the mainstream of the university.
Chapter 2: Review of Literature

Distance education has gained recognition as a legitimate educational pedagogy over the past two decades (Moran, 1991) and has become a preferred mode of delivery for many individuals seeking upgrading opportunities. All three British Columbia universities have Distance Education Units which expand the vocational role of the university. Rapid growth of academic/industry collaboratives during the 1980s highlights increasing vocationalism of universities. Fisher et al., (1994) suggest that lack of public funding and the consequent need for universities to become more entrepreneurial, have prompted reorientation of academic science to include economic outcomes. Campus-based Industry Liaison Offices foster collaboratives such as technology transfer, consultancy and training services.

Technical institutions, seek appropriate liberal studies to remedy deficiencies, complement and enhance a technologist's education. Skosnik (1996) goes to the roots of a liberal education, the "liberal arts," which he defines as the subjects in the "trivium." For Skosnik, these subjects "understood in a manner appropriate to the times we live in" (p.16), are of fundamental importance to any technical/vocational education or training program. Skosnik draws parallels between the "trivium" and workplace needs as documented in contemporary literature: a knowledge of grammar is fundamental to basic literacy; an ability to use logic effectively underlies critical thinking; and, "rhetoric" which applies to clear thinking and presentation of ideas, is key in obtaining and maintaining employment. Like Perkin (1984), Skosnik views the purpose of liberal education as utilitarian. Thiessen (1985) argues for the inclusion of humanities, but cautions on using university-transfer courses with an academic focus. Rather, he advocates that humanities courses should be specially adapted to relate to the technical/vocational field and taught to create student awareness that "ideas do have consequences" (p.77). To the communication and reasoning skills required by Skosnik,
Thiessen adds human relations and values education as necessary outcomes of liberal studies for technical/vocational programs.

Adopting a more generic approach, Lynton and Elman (1988) maintain that the essential outcome of a liberal education is the acquisition of "competence" which they define as "the ability to function effectively in complex and ambiguous situations, to have a sense of being in charge, to be at least to some extent master of one's fate, not a helpless and passive victim of external forces" (p.56). Specifically, they maintain:

If individuals are to function effectively as citizens, as members of a social group, and in their occupation, they must be able to cope with complex realities and rapid change, to tolerate and deal with considerable uncertainty and ambiguity, to make sense of a flood of disjointed and often contradictory data, to assess risks, and at times to choose among competing humane and ethical values (p.56).

For Lynton and Elman a liberal education fosters the ability to integrate a variety of perspectives in dealing with complex issues, or to acquire the "art of utilization of knowledge" (Whitehead, 1949, p. 16), to be able to bridge the gap between theory and practice. They recommend that this synthesis is best accomplished when liberal education is presented as a capstone to the program of studies.

**Stratification of Knowledge**

All systems of higher education exhibit some form of hierarchy derived from relative types and levels of knowledge. Moran (1991) suggests that one way of understanding legitimation of knowledge is to examine how knowledge has been stratified in higher education and the roles played by people and institutions in these knowledge structures. Trow (1984) looks at higher education as a stratified system of institutions ranked formally or informally in terms of status and prestige, wealth, power and influence of various kinds. Trow questions the
relationship between historical priority and institutional status suggesting that in many
countries the higher ranked institutions are the ones which came first. Moran concurs that
institutional age is an indicator of legitimacy and can confer a self confidence and
complacency born of long monopoly. Stratification of knowledge is inextricably linked to the
social history of the country (Engel, 1983) and reflects the acceptance of what counts as
knowledge by institutions sitting at the top of the academic hierarchy of the country.
Referring to Bourdieu (1977), Moran charges that “through their influence on how
knowledge is defined and allocated, higher education institutions have tended to reproduce
hegemonic social values and reinforce existing social stratification” (p.3).

Historically, cultural heritage was defined by academic and social elites in terms of the
education of the “gentleman” (Brown and Scase, 1994). Consequently, the vocational
function of the university has traditionally been marginalised; technical, applied scientific and
engineering studies have taken longer to be legitimised as appropriate studies for institutes of
higher learning given the domination of institutions at the apex of the academic hierarchy
(Halsey, 1961).

The allocation of status and gradual legitimisation of applied knowledge parallels the
development of higher education in most industrial societies. Anderson (1992) views the long
term development of higher education in three phases: prior to 1870; from 1870 to 1950; and,
from 1950 onwards. Ringer (1979) denotes similar time phases as the early industrial phase,
the high industrial phase starting from 1860, and the late industrial phase from 1930 onwards.

Prior to 1870 the universities served largely the older landed gentry and the professional elite,
and the disciplinary value of a liberal education was deemed most appropriate to cultivate the
mind of an educated gentleman (Engel 1983). While professional education in law, medicine and theology was the primary function of the medieval universities, the Renaissance period had resulted in a new concept of a “liberal education” becoming an end in itself rather than merely preparatory to these higher professional faculties (Engel, 1983). Ringer (1979) noted little connection between higher education and economic life during this early industrial period. To the contrary, the anti-professional spirit became the hallmark of a liberal education and university study and a symbol of status. John Stuart Mill summarised this opinion:

The proper function of a University in national education is tolerably well understood. At least, there is tolerable agreement on what a university is not. It is not a place of professional education. Universities are not intended to teach the knowledge required to fit men for some special mode of gaining their livelihood. Their object is not to make skilful lawyers, or physicians or engineers, but capable and cultivated human beings .... Men are men before they are lawyers, or physicians or merchants, or manufacturers; and if you make them capable and sensible men, they will make themselves capable and sensible lawyers or physicians.

In the first wave of socio-historical development of 19th century industrial nations, the education system was seen primarily as a means of separating the elites from the masses, the education for the privileged few into a culturally superior world. Echoing views held of mid-19th century Britain, Jones (1988) asserts that the most widely touted value of a liberal education was its function as social preparation and its concomitant to conferring social status. Status ascription by type of education was not unique to England, however Jones points out that public schools and universities underscored their social status through curricular emphasis on a liberal education. He adds, “it was the education of the social and government elite ... it was the mode of preserving or elevating one’s status” (p.66). Engel (1983) concurs, intimating that proponents of liberal education regarded it not “only as being of higher educational value than the mere ‘information’ conveyed in professional education but also of higher social value” (p.296).
Brown and Scase (1994) contend that state institutions shape social structure. However, Jarausch (1983) sees the relationship between higher education and social change as circular and interdependent with both transforming each other. Jarausch (1983) refers to the emergence of a “modern” higher education system between 1860 and 1930, in response to industrialisation, as a “seismic shift” where “a small, homogeneous, elite and pre-professional university turned into a large, diversified, middle-class and professional system of higher learning” (p.10).

Industrialisation in the mid nineteenth century brought new wealth, new ideas and an expanding middle class concerned with authority, status and power. Demand for “useful knowledge” (Silver, 1980) increased as the middle classes attempted to come closer to the centres of social, political and economic power. However, as they sought not only to wrest power from the upper classes but also aspired to their status, the middle classes and the new universities embraced a classical curriculum as well (Moran, 1991). The two trends co-existed and overlapped. In pure or adulterated form, Silver saw a deliberate identification of knowledge with culture and power. Consequently, Perkin (1984), contrasting medieval and industrial societies, points out that power meant different things to different societies.

While the industrial society was fuelled by capital and largely distinguished by entrepreneurship, Perkin (1989) saw the emergence of a “professional society as a logical continuation of industrial society” (p.18), where a professional society is based on human capital created by education and enhanced by strategies of closure. Jarausch (1983) underscores the crucial role of higher education in the emergence of professionalism as he cites Bledstein’s definition of a professional:
a full time occupation in which a person earned the principle source of an income ... mastered an esoteric but useful body of systematic knowledge, contemplated theoretical training before entering a practice or apprenticeship, and received a degree or license from a recognised institution (p. 29).

Increased professional embodiment in higher education prompted questions of what counted as knowledge, how knowledge was to be distributed and who was to decide. Silver (1980) saw knowledge as the gateway to participation in the power structure of contemporary society, and that “different and controlled levels and forms of access to knowledge meant different degrees of access to power” (p. 114). Moreover, what counted as “right” knowledge was processed by a class which controlled access to it and was identified with the “right” social background. According to Silver, “useless” classical learning was power in an understood sense ... other learning was admitted to respectability and institutional status and influence only cautiously, under pressure and on strict terms” (p. 115).

By the end of the nineteenth century, expert knowledge was acquiring a new status as the power of the professional. The demands for knowledge set up by industrialisation became institutionalised in the universities (Halsey, 1961). New areas of study became legitimised forms of knowledge. For example, the new civic universities in England, founded in response to scientific and technological needs of local industry, moved aggressively into professional education (Engel, 1983), introducing engineering, architecture, commerce, dentistry and veterinary medicine. Brown and Lauder (1992) attribute widespread development of the professions to the shift in importance of skilled labour. Ultimately, however, in search of social recognition, the original dynamism and distinctiveness of the civic universities gave way to imitation (Anderson, 1992) and, according to Jarausch (1983), “altered their entire mission from higher technical training towards the traditional university function” (p. 19).
Professionalism introduced new organising principles of social structure based on human capital, trained expertise and selection by merit. Horizontal stratification based on land and capital was replaced by professional career hierarchies, rising vertically to unequal heights, beside each other and in competition for power and prestige (Perkin 1989). In contrast to land and capital, professionalism as an organising structure was not confined to the few but reached down the social pyramid to persons of all classes capable of skilled and specialised service and furthermore embracing occupations once deemed beyond professional aspiration (Perkin 1989). The advancing culture of professionalism and the construction of higher education networks to produce professional experts increased that status and the power of the “professional authority.” The power of the expert depended on the accreditation of his knowledge, thus knowledge as power was linked not only with skill and occupation but with qualification, credentials and accredited institutions (Silver, 1980). As the university created and validated an ordered body of knowledge on which the claims of professional expertise rested, the university degree was both an external sign of “scientific status” and justification of power and authority (Engel, 1983). Perkin (1989) concurs, contrasting the entrepreneurs of the industrial society who sought minimum state interference to the professional who “looked to the state as the ultimate guarantor of professional status” (p.xiii). Jarausch (1983) therefore concludes that the coincidence between the rise of the new professions and the transformation of higher education was not entirely accidental. Universities and especially technical colleges furnished novel careers through scholarly specialisation while aspiring practitioners repeatedly tried to legitimate their claim to professional status through higher learning.

Further stratification of knowledge occurred as a result of the expansion and diversification as higher education systems, in most industrialised societies, shifted from an elite to mass systems. Following Teichler (1988), four major forces are identified as driving educational
expansion and influencing the direction of educational change: growth of scientific and
technical knowledge; human capital investment for the provision of highly qualified
manpower; social demand, post compulsory education was regarded as a civil right; increased
social wealth enabled education to be viewed as cultural enrichment and a consumer benefit.

The extension of the existing university sectors accounted for part of the expansion.
However, changing occupational and social structures resulted in the majority of
industrialised countries opting to establish or expand the non-university or "short-cycle"
higher education institutions (Organisation for Economic Cooperation and Development,
(OECD), (1991). The OECD identified three kinds of short-cycle institutional models: the
multipurpose model characterised by Canada's community colleges; the specialised model,
such as technical institutions offering mostly vocationally oriented, non-degree level courses;
and, the binary model offering courses and qualifications intended to be distinct from but
comparable to those in universities, for example, the United Kingdom Polytechnics, the
Australian Colleges of Advanced Education, and the German Fachhochschulen. These new
institutions had more flexible access policies and followed a vocational ideal fulfilling
economic needs not addressed by the universities. Their common denominator was to provide
alternative educational opportunities to universities, offering qualifications enabling students
to improve their position in the labour market (OECD, 1991). The need to provide a suitably
trained and motivated workforce provided a powerful argument for removing educational
barriers to working class mobility (Brown and Lauder, 1992, p.10). Halsey (1961) contrasts
medieval and industrial periods where the relationship of higher education to the economy
was "imperfect" usually involving belated adaptation to occupational demands of an
increasingly complex culture, with the technological society where higher education system
becomes a determinant of economic development and hence of stratification.
Using somewhat self-fulfilling terminology, the OECD (1991) noted that, while these “less noble” institutions were fully integrated into the higher education system, they clearly suffered from a lack of status and prestige. For Lowe (1983) the binary system protected the status of universities and further exemplified stratification reflecting social inequalities. According to Anderson (1992), the diversion of students into less prestigious institutions enabled both old and new universities to retain the more elitist features, whereas Moran (1991) points out that universities have further protected their prestige and status by monopolising the more prestigious professional credentials.

Demarcation of Knowledge

Popper (1965) asserts that the central problem of epistemology always has been and still is the growth of knowledge “and that the growth of knowledge can be studied best by studying the growth of scientific knowledge” (p.15). Science is empirical in that scientific truths are verifiable through experimentation and observable facts of nature. Consequently, in modern societies science is near to being the source of cognitive authority (Barnes and Edge, 1982). During this century the primary route for increasing the power and raising the status of knowledge has been to make it scientific (Aronowitz, 1988). Thus as other forms of knowledge sought legitimacy they aspired to gain more “scientific capital” (Goodson, 1993).

Popper (1965) alludes to “the problem of demarcation” (p.34) in seeking criteria to differentiate between the sciences and the non sciences. Gieryn (1983) suggests that demarcation involves identifying “unique and essential characteristics of science that distinguish it from other intellectual activities” (p.781). Demarcation implies constructing a boundary around a body of knowledge. As knowledge becomes more fragmented then
boundaries are forged not only between disciplines but within disciplines. The construction of boundaries involves boundary work. Fisher (1988) defines boundary work as:

those acts and structures that create, maintain and break down boundaries between knowledge units. Knowledge units are sub-disciplines, disciplines or groups of disciplines. Boundary work involves individuals, institutions and social structure simultaneously (p.162).

Boundary work reflects the efforts of individuals to create an opportune situation for their particular sphere. Scientists endeavour to establish a favourable public image for science by contrasting it favourably to other non-scientific intellectual activities to acquire increased resources or defend professional autonomy (Gieryn 1983), whereas the “new middle class” are active boundary workers to maintain their class status (Fisher 1992). Boundaries are not fixed entities but are manipulated by boundary workers to achieve a particular goal. John Tyndall (1820–1893), in attempts to gain more public support for science in Victorian England, ascribes different characteristics to science as he demarcates it from the intellectual authority of religion on the one hand and the practicalities of engineering and mechanics on the other. Gieryn (1983) concludes that “the boundaries of science are ambiguous, flexible, historically changing, contextually variable, internally inconsistent and sometimes disputed” (p.792).

Exponential increases in the quantity of knowledge, along with differences in its quality and forms, have promoted questions relating to the control of knowledge. Fisher (1988) employs the concept of boundary work in establishing a relationship between power and knowledge. Fisher (1992) asserts that “power penetrates knowledge systems in part through boundary work ... that boundary work incorporates the process whereby legitimacy and cognitive authority are attached to ideas” (p.13).
Boundary work promotes a hierarchically stratified knowledge system. In his work on school curricula, Goodson (1993) identifies three major traditions — academic, utilitarian and pedagogic — with attendant differentiated status. Goodson (1993) concludes that the high level status of the academic tradition, “characterised by abstract theoretical knowledge and divorced from the working world of industry and the everyday world of the learner” (p.197), is maintained in part through what can be seen as boundary work in the self interest of certain teachers who desire to maintain established links to resources and career prospects. As a result of this turf warfare, most monies for education are invested in subjects devoid of practical and social relevance. Goodson (1993) points out that this is both economically dysfunctional and diametrically misdirected in a mass education system.

Credentialing of Knowledge

Credentialism is in fact amongst the most powerful of social dynamics and the most powerful force at work in shaping the size, character and distribution of the education system. Over the past century or so it has moved the education system to the centre of the struggle by social and occupational groups for relative advantage (Ashenden 1988, p.24).

Stratification of knowledge is overtly expressed in terms of educational credentials. According to Moran (1991) educational credentials permeate the occupational structure and are reflected in hierarchies of knowledge within higher education institutions. Moreover, she adds “the more scarce and valuable a credential or the profession to which it is attached, the more prestige tends to accrue to the institution” (p.21). Historically, in Canada only academic study has been rewarded with a globally recognised credential, namely a degree. Non-university graduates currently experience a credential-based barrier to occupational mobility (MET, 1993, p.97) and social mobility. Two competing theories seek to explain this relationship between education and occupational stratification.
Technocratic theory (Kerr et al., 1973; Bell, 1973) suggests that rapid technological change is the defining feature of advanced industrial societies. The expansion of higher education is explained from a human capital perspective, as the need for higher levels of knowledge and skills to supply the workforce. The labour market is characterised by a hierarchy of occupations matched with a hierarchy of talent reflected in the competition for academic and professional credentials. From this perspective, occupational and social mobility rest solely on meritocratic principles rather than class or family status. Managerial and professional careers are not restricted to the elite, rather exclusion of a particular class means economic waste.

In contrast to this approach, the theory of social closure (Parkin, 1979; Collins, 1979) is based on the principles of social exclusion, recognising the existence of class divisions and power struggles among occupational groups. Parkin (1979) proposes two main exclusionary devices by which the “bourgeoisie” maintains itself as a class: through property, or through academic or professional qualifications or credentials. Parkin advocates that each restricts access to rewards and privileges. Specifically, he notes “credentialism is a form of closure designed to control or monitor entry into positions in the division of labour” (p.47/8), and is a reflection of boundary work.

Collins (1979), applying the social exclusion theory to the changing relationship between education and occupational structure, asserts that this can be understood in terms of group conflict over scarce resources (credentials, income, occupational status), particularly as the middle classes have been increasingly dependent on access to professional occupations to reproduce social status. According to Collins, the development of the modern professions was far from indicating a “triumph of technocratic meritocracy” (p.131), rather was “only a
new variant on the familiar processes of stratification through monopolising of opportunities” (p.132). Brown (1990) introduces the ideology of “parentocracy,” replacing meritocracy where the competition for credentials is based on the wealth and wishes of parents rather than the abilities and efforts of students. Bourdieu and Passeron (1977) suggest that the middle classes have increasingly used the education system to capitalise on their cultural assets. Cultural capital has long been recognised as vital to the reproduction of the middle classes. Social status and security previously ensured by the acquisition of material property is now more reliably secured through the acquisition of cultural capital, particularly in the form of academic credentials from prestigious institutions which facilitate entry to professional and managerial employment (Brown and Scase, 1994). Ringer (1979), albeit in sexist tenor, advocates the most plausible relationship between education and social stratification construes the education system as an “intermediary between the social standing of fathers and that of their sons” (p.12).

Consequently a bureaucratization of the recruitment process, whereby access to all occupational careers is based on the acquisition of credentials through formal examinations, has fuelled a credential inflation which Collins (1979) regards as the most powerful, direct agent of the expansion of higher education. Increasingly the primary function of middle class education has become that of furnishing credentials necessary for jobs in the expanding bureaucracy of the public and private sectors (Hickox and Moore, 1992), exacerbated by growing labour market polarisation and over supply of graduate labour (Dore, 1976). Moreover, credentials are a means of occupational and consequent social mobility, facilitating access to “middle class” for those previously excluded:

Once you’ve got a degree you’re sort of classified as a graduate and I think the influence or the impact of your social background sort of slides back, and the main
thing is that you’re a graduate. It’s not so much you’re middle, upper or working class any more (cited in Brown and Scase, 1994, p.69).²

Brown and Scase (1994) reject that dislocations between education, credentials and labour market opportunities can be attributed solely to social exclusion. Rather, they suggest that economic restructuring and a shift in workplace organisation from a bureaucratic to adaptive paradigm has lead to different requirements for knowledge and skills. A corresponding re-definition of careers from bureaucratic to adaptive has implications for how cultural capital is deployed in the market for jobs. The change in cultural “code” (Brown, 1995, p.42) represents a shift from a bureaucratic to a charismatic personality. According to Brown employers now seek a “personality package” which values personal and interpersonal skills as much as the acquisition of expert knowledge. However, Brown and Scase (1994) charge that “competition for credentials is inhibiting students’ acquisition of personal and social skills” (p.24). Frequent job changes, a decrease in secure long term employment, downsizing and a decoupling of bureaucratic career routes into the upper echelons of corporations, have placed emphasis on academic and professional credentials as an insurance policy as the value of “organisational” assets decline. As the supply of educated labour has increased, employers are requiring higher levels of credentials for specific jobs. Collins (1979) sees this as symbolic of credential inflation rather than significant changes in the demand for technical knowledge. Dore (1976) warns of a negative aspect of credential inflation where students and parents regard the credential as more important than the knowledge it imparts.

As more people enter the labour market, employers are increasingly using credentials as a screening device. In this context Brown and Scase (1994) see the credential as the key that unlocks but does not open doors. In the opinion of Halsey et al. (1980), the process of credential inflation has enabled possessors of cultural capital to retain their differential
advantage despite rising levels of working class credentialisation. Murphy (1988) concurs, noting that the predominant effect of credentials has been that of exclusion, domination and inequality. Collins (1979) argues that the credential has gained currency due to its adoption by professional groups as a means of controlling access. Raising standards in the name of increased complexity of professional occupational skills reflects the exclusionary tactics of professional groups seeking to limit the number of recruits (Brown and Scase, 1994). Credentials are then being legitimated as a way of screening students for different segments of the labour market based on social position and power rather than individual talent.
Part Two: Trends in Other Jurisdictions

Other industrialised countries have recognised applied knowledge to the baccalaureate level in the university and non-university sectors for over two decades, whereas British Columbia did not legislate degree granting status to specific institutions in the non-university sector until January 1995. To provide a comparative context for the study, the first part of this review will focus on three jurisdictions, the United Kingdom, Germany and Australia. These countries provide an appropriate framework for the study of the evolution of practice-based degrees in British Columbia. First, these degree opportunities are well established in these jurisdictions. Second, Germany and Australia, like Canada, have federal systems, thus any effects of federalism can be examined. Third, the majority of expansion and diversification of higher education in all three countries occurred by introducing short cycle institutions in the non-university sector and fourth, all three countries initially adopted a binary model of post-secondary education. An evolving system has abolished this in Australia and the United Kingdom whereas Germany has retained the binary model. The current British Columbia model, still in its infancy, has yet to be defined, but has the components of a similar binary model where degrees in the non-university sector complement rather than compete with those in the university sector. The literature will first give a brief historical overview of applied education in each of these jurisdictions and then focus on the institutions offering applied education most similar to BCIT. The focus will be on the Polytechnics in the United Kingdom, the Fachhochschulen in Germany, and the Colleges of Advanced Education in Australia. The final section will first provide an overview of the development of applied knowledge in Canada with a focus on Alberta, the only province other British Columbia to offer degrees in the non-university sector.
United Kingdom

The defining feature of the British system of education is that historically it has been geared towards socialisation of each generation for their future position in the class structure and domestic division of labour (Ashton et al., 1992). The literary tradition dominated education up to the present century. An elitist system prevailed. Blackman (1992) asserts that scientific and technological advances were historically held back by class prejudice; as such, "new knowledge" became ultimately linked to the training of lower classes. Perception of status led to a pervading theme in British professional and technological education; initially much took place outside of higher education but ultimately gained university status. Perkin (1984) acknowledges this as he links knowledge to power:

> Sometimes power weakened and had to be rekindled outside the university, as in the scientific and early industrial revolutions, when most of the new science and technology had to be generated by ad hoc academics and societies and taught in new institutions of technical instruction. Sometimes the demand for power outstripped the capacity, as in the late industrial and postindustrial period, when new powerhouses of different shapes and sizes had to be built to meet the calls for more expertise and for mass higher education demanded by the age of the masses and of the uncommon expert (p.19).

Here Perkin identifies two distinct time periods, the late 19th and the mid 20th centuries. These periods correspond with the major shifts to legitimise forms of applied knowledge in the United Kingdom, each one driven by economic and social agendas and occurring in response to international competition. For the purpose of this study, the general trend towards acceptance and legitimisation of applied knowledge is discussed within the three stages of development of higher learning proposed by Anderson (1992): prior to 1870; from 1870 to 1950; and, from 1950 onwards.
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Prior to 1870

Prior to 1870, Oxford and Cambridge, “ancient, rich and secure” (Halsey & Trow, 1971, p.41), dominated higher learning in England. Evolving as “primarily vocational schools for the professions” (Perkins, 1984, p.22), in contrast to most European and Scottish universities which continued to combine general education with vocational preparation for the professions, Oxbridge had abdicated the role of professional education offering only a narrow curriculum based on classics at Oxford and mathematics at Cambridge (Anderson, 1992). The educational ideology was that of liberal education geared to serve the needs of the aristocracy, the gentry and clergy. According to Halsey and Trow (1971), the universities were more tied to the church than to business. Although “professional” training had been taking place in the universities, liberal education and research pushed much professional preparation outside the university (Jarausch, 1983). Law was studied at the Inns of Court and Medicine at the London Hospitals (Halsey and Trow, 1971, p.47). In general, systems of apprenticeship became the model of professional education (Engel, 1983).

According to Halsey and Trow (1971), the fact that Britain was the first society to experience the industrial revolution had special consequences for the subsequent development of education in general and the universities in particular. An industrial middle class, “with a hunger for higher education” (Perkin, 1984 p.22), had developed before the system of modern or reformed universities. The impact was two-fold. First, modern scientific and technological knowledge began in new institutions, for example the Mechanics Institute and subsequent technical colleges. Second, unfavourable attitudes developed towards the universities which were perceived as serving the upper classes. Attitudes of mutual suspicion and contempt prevailed between the universities and the established professions (Engel, 1983) resulting in limited contact until about 1860. Such attitudes had a profound impact on new occupations.
which aspired to professional status, for example engineering, accountancy, architecture and dentistry. Imitating the respected professions, these new occupations put emphasis on forming professional associations and relied on traditional systems of apprenticeship (Engel, 1983) rather than the education system.

**Between 1870 and 1950**

The first major shift towards legitimation of applied knowledge through recognition at the baccalaureate level began in the mid-19th century. The 19th century was one of intense industrialisation. Scientific and technological developments transformed techniques of industrial production and communication, resulting in a changed economic structure (Blackman 1992). Lowe (1983) attributes the transformation of higher education during this period to the growing demand for vocational training, intensified by foreign competition. Specifically, Engel (1983) draws attention to a superior German industry which was supported by elaborate systems of scientific, technological and professional education. Consequently, “calls for renewed and expanded professional studies began to form a distinct ideology of university reform” (Engel, 1983, p.295).

Development of vocationally oriented education at the university level in England first took place in the component colleges of the University of London, established from an economic perspective to provide a skilled workforce serving local commerce and industry, and socially “to improve the intellectual and moral condition of the industrial classes” (cited in Wilkinson 1980). However, the predominant thrust in recognition of applied knowledge can be attributed to the evolution of the civic or “Redbrick” universities from corresponding civic colleges, founded in the major industrial cities in response to the rising aspirations and demands of the industrial bourgeoisie for scientific and technological manpower. Many of the
founding colleges had their origins in the Mechanics Institutes. Courses, aimed at workers in local industries, were organised initially in the evenings or on a day release basis. Implying academic drift, Lowe (1983) reports the gradual erosion of part-time to full-time studies as colleges increasingly neglected the skilled artisans, whom it was foreseen they might train, and concentrated on teaching to degree level, as they sought to establish their position in the status hierarchy.

The civic or “university” (Lowe, 1983) colleges gained charters as independent “Redbrick” universities at the turn of the century. Curriculum indicated more practical and vocational areas such as applied science, engineering and commerce. In contrast to the older universities, new occupations aspiring to professional status were accepted readily. The rise of these modern universities reflected the professionalisation of an industrial society (Fisher et al., 1994). In Engel’s (1983) opinion, the most striking point in introducing a more utilitarian approach was the lack of response from the public, the universities and the professions themselves, suggesting that changes in higher education are limited by institutional tradition and social constraints (Jarausch, 1983).

Academic drift was evident throughout as the new institutions sought “academic respectability.” University Colleges had rejected the technocratic model in favour of the Oxbridge model, which Lowe (1983) asserts “drove a wedge between “humane” and applied studies which was to prove immensely significant for English society in the twentieth century” (p.53). Similarly, once established, the new provincial universities re-directed their scope and balance towards arts and pure science to imitate the norms of Oxbridge (Halsey and Trow, 1971). This shift was not universally welcomed. In 1911, a Birmingham local ratepayers’ association petitioned the Privy Council:
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So far as the Birmingham University as such is concerned, it is of no use whatever to the industrial classes; as far as we can see all that has been done by merging the Masons Science College into the University has been to divert the funds intended for ... the industrial classes to the use of the wealthy classes, and now the middle and working classes are being asked to contribute towards the wealthy and the well-to-do.\(^3\)

At Oxford and Cambridge movement towards technical and professional education proceeded slowly and amid opposition (Engel, 1983). Professional degrees were first introduced in the early 20th century.

Technological studies were introduced into the British university system through the provincial universities and the establishment of engineering studies at Cambridge and London. However, their scope was restricted by the persistence of established ideas of liberal education which, according to Engel (1983), severely limited their potential for growth. Consequently, technological education continued predominantly in sub-university institutions through the expansion of practice-based technical schools, colleges and institutes under the auspices of Local Education Authorities. National Certificates and Diplomas, administered through joint committees of the Board of Education and the Institution of Mechanics Institutes, provided a foundation for technical qualifications in Britain. External degrees were granted usually by the University of London. This collective was referred to as the system of "technical education" (Lewis, 1992, p.26).

Post 1950

The second major shift towards the legitimation of applied knowledge in the United Kingdom began in the 1950s, but accelerated in the expansion and diversification into "new power houses" (Perkin, 1984) of higher education following the Robbins Report (1963), and consequent shift from elite to mass education system. This phase exhibited similarities to the
expansive phase of the 19th century; expansion of applied knowledge was initiated outside the university sector but was ultimately incorporated into this sector. However, in contrast to the earlier period which involved individual institutional evolution, for example, from Mechanics Institute via civic college to civic university, the 20th century institutions, the Polytechnics and Colleges of Advanced Technology, retained their institutional identity and were admitted to the university sector as a group. Additionally, the 19th century legitimised what is now recognised as theoretically grounded professional education, whereas this latter phase of legitimization of applied knowledge to baccalaureate status has recognised more practice-based technological studies.

The status elevation of technological education can be traced to the Percy Committee (1945) which, reporting on "higher technical education in England and Wales and the respective contributions to be made thereto by universities and technical colleges" (Becher, 1987, p.18), determined that over than half the national output of professionally qualified engineers were being educated on a part-time basis in technical colleges (Becher, 1987). Attempts to rationalise the higher education function of technical colleges culminated in the 1956 White Paper (ME, 1956) designating some of the major technical colleges as Colleges of Advanced Technology in 1957. These Colleges of Advanced Technology were mandated to shed lower level studies and concentrate on degree studies.

The Robbins Report (1963) proclaiming, "courses of higher education should be made available for all those who are qualified by ability and attainment to pursue them and who wish to do so" (p.8), is generally regarded as instrumental in social reform leading to a mass education system, although Anderson (1992), citing Lowe, suggests Robbins "could do little more than legitimise what had become inevitable" (p.25). The Robbins recommendations had
a direct bearing on the visibility and status of applied knowledge. First, the Colleges of Advanced Technology were designated technical universities in 1964 (Wilkinson, 1980; Anderson, 1992). This new group of technical universities represented a radical departure from tradition in that they were specialised from the outset, concentrating heavily on engineering and applied sciences, and stressing cooperation with local industry, particularly in the integration of teaching and industrial experience (Halsey & Trow 1971). Second, the expansion of the higher education sector in response to social demand led to the creation of a significant new component of the higher education system, the Polytechnics, and third, the Council for National Academic Awards (CNAA) was established in 1964 to validate and award degrees at higher education institutions outside the university sector.

Robbin’s administrative proposal however, accepting the historical unitary structure of higher education with the universities at the apex, was rejected. Crossland (1965), Minister of State for Education, advocated a binary approach both on economic and social grounds. Economically, he argued that the demands for vocational, professional and industrially based courses up to degree level both on a full and part time basis couldn’t be met fully by the universities. Socially, he argued for a parallel rather than a laddered system to avoid downgrading the non-university professional and technical sector, and to lessen the hierarchical obsession of the universities. However, Anderson (1992) argues that “the binary system protected the status of the universities and can be seen as a further example of segmentation reflecting social inequalities” (p.27). Furthermore, Crossland advocated the importance of a substantial part of higher education being “under social control and directly responsive to social needs.”
The Polytechnics

Thirty new polytechnic institutions were established between 1969-73, primarily from amalgamation of major colleges of technology, of commerce and business studies, of art and design. Many of these founding colleges had long histories of degree level studies. Consequently, with a substantial inheritance of educational development, the polytechnics had a sound basis on which to provide higher education attuned to the needs of students and employers. In contrast to universities, polytechnics placed a greater emphasis on teaching. Programs at all levels were vocationally marketed and their research was applied with a significant proportion sponsored by industry. However, Lewis (1992) notes a progressive blurring of these boundaries.

Polytechnic education covers a broad spectrum of educational opportunities: creative and expressive; professional and commercial; those of community professions; and, those of the humanities, science, engineering and the technologies. Diversity of programs within these areas ranges from the non-degree level to higher research programs. The largest group of sub-degree yet advanced credentials are Higher National Diplomas and Certificates of the Business and Technician Education Council (BTEC). Most polytechnics offer opportunities for a higher degree or diploma. An M.A. or M.Sc. is awarded after an approved course of formal study, a Ph.D. or M.Phil. requires supervised research. Referring to degree level studies, Lewis (1992) points to the highly structured approach to curriculum and teaching that characterises British higher education. However, Gillespie and McArthur (1991) and Jones (1995) note a trend to more flexible options for students through modularization of programs. Jones sees the reorganisation of studies resulting in modularization as a structure “Canadians would find normal” (p.4).
Duration of studies at the Polytechnics is similar to the traditional universities. First degree programs usually take four years, the third year being a "sandwich" year of supervised work experience. Access policies have resulted in polytechnics having a more heterogeneous student population, specifically in terms of race and age (Evans, 1993) than traditional universities. Gillespie and McArthur (1991) were impressed by the flexibility in terms of students exit and entrance to programs with appropriate credentials, recognising previous education. In particular, they noted bridging and laddering opportunities within the system from trades to diplomas to degrees. However, while the original mandate of the polytechnics was to provide greater opportunities for the part-time learner, Jones (1995) sees a grossly overwhelming emphasis placed on the full time learner and relative disregard for the part-time learner. Lewis (1992) concurs that students are expected to complete their studies in three or four years of full time or sandwich study at the degree level.

In their bid for legitimacy, polytechnics from the outset put a high priority on quality assurance. Demanding quality assurance procedures were implemented to ensure high academic standards (Lewis, 1992). Prior to 1992, polytechnic degrees were awarded mainly under the aegis of the Council for National Academic Awards (Lewis, 1992; Jones, 1995). Through peer group evaluation, the CNAA operated a rigorous system of program validation and institutional recognition (Lewis, 1992).

The polytechnics were originally designated under the auspices of Local Education Authorities, following recommendations in a White Paper, A Plan for Polytechnics and Other Colleges (1966). The Education Reform Act (1988) removed polytechnics from the local authority sector, incorporated them by statute (Lewis, 1992) and established a channel of public funding. The Further and Higher Education Act (1992) abolished the binary stream.
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The polytechnics were admitted to the university sector with the same rights as the traditional universities. This was economically motivated with the hope of increasing enrolment in science, engineering and technology, and socially motivated "in particular to eliminate the view held by many parents and students alike that polytechnic education is not equal to university education" (MET, (1993), p.55). Legislation enabled polytechnics to award degrees in their own name, use the title "university," and be funded on the same basis as the traditional university. Lewis (1992) hopes that most polytechnics will cherish their distinct mission however, Jones (1995) reports that their mandate is now identical to that of the older universities. According to Lowe (1983) the highly stratified system of higher education in England is a consequence of the unreadiness of the universities to respond to social change.

Germany

Germany like Canada is a federal system, thus the politics of its education system are the politics of federalism. Germany has 16 federal states (Lander), five of which were originally East Germany and became part of the Federal Republic of Germany following unification in 1990. However, in contrast to Canada's "soft federalism" (Smith and Wood 1992; Watts, 1992), Germany is distinctive in that it has a high degree of nation-wide coordination between both Federal/Lander and inter-Lander governments. Jurisdictions of responsibility are actually enshrined in legislation (Teichler, 1992). This "inter-locking federalism" (Watts, 1992) is evident in the planning, organisation and management of all facets of German post-secondary education. The acceptance and legitimation of applied knowledge in Germany is discussed in the three stages identified by Ringer (1979).
Early Industrial Phase

The historical roots of the German universities can be traced back to the medieval universities of 12th century Europe. The first German universities were established in the fifteenth century; their primary task was to educate servants of the Church and State (Peisert and Framheim, 1994). Specifically, Ringer (1979) points to the absence of any relationship between higher education and business at this time. In contrast to Britain where 19th century reforms initiated the acceptance of applied knowledge into the university sector, the reform of the German universities, associated with Wilhelm von Humboldt, caused further demarcation between pure and applied knowledge. These reforms conceptualised the university as free from immediate social interests and were based on the distinction between university education and professional practice. Special emphasis was on basic disciplinary research; applied technical science had no place in these universities. Central to Humboldt’s ideal of education was the German concern for “Bildung” (self cultivation), a process by which an individual seeks to shape character and personality to its optimum through acquaintance with “the highest ideals known to man” (Taylor, 1981, p.13). Humboldt defined the university as the embodiment of the highest and purest forms of knowledge, “Wissenschaft.” According to Perkins (1984) Wissenschaft was a process rather than a specialised form of knowledge. It represented an approach to learning, an attitude of mind and a capacity to think. The concept of Wissenschaft was so “pure” and so widely removed from practical knowledge and applied science that engineering and other technologies were excluded from the university sector until the very end of the 19th century. Primacy was given to education through the classics and philosophy. Humboldt differentiated between general education which would “purify and cleanse” (Taylor, 1981, p.14) and special education which provided skills for utilitarian purposes. Any integration would render education impure. However, while tradesmen whose curriculum contained both science and arts were considered “unnecessary and dangerous”
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(Taylor, 1981, p.14), Humboldt acknowledged the useful purpose served by technical schools.

Professional training occurred in what Lundgreen (1983) referred to as a well planned, functional spectrum of institutions, one commonality of which, he adds, “is ‘academization’ or endeavour to gain university-like status” (p.150). Technical education in the 19th century was offered in technical institutes and individual academies of mining, forestry, agriculture and veterinary medicine (Ringer, 1979). Technical institutes, at the beginning, were devoted primarily to engineering and applied sciences. They evolved from “polytechnic” schools founded in the 1820s in the secondary education sector to meet the needs of advancing industrialisation (Leszczensky, 1992). Although separate academies continued to exist, technical institutes evolved as the most important non-university institutions of higher education in Germany (Ringer, 1979).

High Industrial Phase

During the high industrial phase from 1860–1930 (Ringer, 1979), Germany like other industrialised countries experienced significant expansion in higher education. Much of this dynamism was due to the explosion of higher technical education (Jarausch, 1983) in response to Germany’s belated industrialisation (Ringer, 1979). In the 1870s, some of the polytechnics were elevated to the tertiary sector and designated as Technical Universities (Technische Hochschule) (Berchem, 1988). Predictably, the new technical universities had to battle against the entrenched monopoly of the universities to attain equal academic status (Peisert and Framheim, 1994). Following bitter conflict which pitted the German Society of Engineers and the technical universities against stubborn resistance of the university professorates, the technical universities received authority to confer doctoral degrees in 1899.
(Ringer, 1979). The remaining polytechnics developed into middle level technical engineering colleges, producing “practical engineers,” a new concept developed by the Association of German Engineers. These engineering colleges remained in the secondary sector and were renamed Ingenieurschulen in 1938 (Berchem, 1988).

Interaction between higher learning and professionalisation showed marked differences from Britain, due primarily to the onset of industrialisation relative to the development of higher education in the two countries. Belated industrialisation in Germany meant that the higher education system had already evolved, moreover, was a state monopoly and was in a position to control the demands of many occupational groups for professional legitimation (McClelland, 1983). In contrast to Britain where, vigorous professional organisations and autonomy had fostered mutual distrust and conflict between the professions and the universities, higher education in Germany played a central role in professionalisation. In part this is attributed to official discouragement of national professional organisations and ineffectiveness of existing professional organisations (McClelland, 1983). Furthermore, McClelland suggests that an interactive triangle, which includes the professions and their representative organisations, the higher education institutions and the German states, regulated the advance of professionalisation. As in Britain, aspiring new professions modelled the career paths of established professions. However, in contrast to Britain, this meant lobbying for acceptance into higher education. Consequently, professional identity remained more closely associated with public authority than with private professional organisations. Jarausch (1983) notes that during this period Bildung (cultivation) gave way to Ausbildung (professional training). However, the entrenched philosophy of Wissenschaft
resulted in the founding of new specialised professional schools rather than the incorporation of new pedagogical functions into existing universities, or even technical schools (McClelland, 1983).

Late Industrial Phase

Germany, like the United Kingdom and Australia, responded to social and labour demands of the 1960s by expanding the existing university system but primarily by establishing a binary stream, a non-university sector of higher education. The German Fachhochschulen evolved as the alternate sector. Division of higher technical education into the secondary and tertiary sectors had resulted in confusion and controversy in the European Community over recognition of formal qualifications (Leszczensky, 1992). Additionally, the desire of students in the engineering colleges to increase their social status led to student protests in the mid 1960s for elevation of these colleges to the higher education sector (Leszczensky, 1992). Economically, the need existed for a more highly qualified workforce and alternate access routes to higher education. In response to these concerns, the Fachhochschulen were established in the late 1960s and early 1970s by merging former engineering colleges and other advanced vocational schools, especially those for business, social work, art and design, and agriculture, and have subsequently played an important role in the process of economic, technical, industrial and social development in Germany. The founding schools were all originally part of the secondary education system, but were raised to the tertiary level following an: “Abkommen zwischen den Landern der Bundesrepublik Deutschland zur Vereinheitlichung auf dem Gebiet des Fachhochschulwesens (Maybaum, 1989, p.8), that is an agreement between federal states (Bundeslander) on the standardisation of the Fachhochschule system on October 31, 1968. According to Hoyningen-Huene (1992) the
Fachhochschulen are now regarded as equivalent in standing but different in function from the universities.

The Fachhochschulen

The mandate and structure of the Fachhochschulen were clearly defined in the Federal Framework Act for Higher Education (Hochschulrahmengesetz) (1976) and its subsequent amendments, along with higher education legislation in the Länder. As degree granting institutions from the outset, the function of the Fachhochschulen was defined on a national level and enshrined in legislation:

By means of application-orientated teaching the Fachhochschulen prepare students for professional activities which require the application of scientific knowledge and scientific methods or the ability to carry out artistic design. In fulfilling these educational requirements, the Fachhochschulen carry out research and development work (Fachhochschule Law, 22 November 1977, Art.3).

The third amendment of the Framework Act (1985) was particularly important for the Fachhochschulen as it gave them equal status as an academic institution within the higher education system. Prior to this the laws differentiated between Fachhochschulen and “academic” institutions (Leszczensky, 1992). According to Maybaum (1989), the Fachhochschulen were created to be higher education institutions with a range of courses with a practical application, a clear organisation of studies, and a period of studies of shorter duration than universities. At present there are 125 Fachhochschulen in Germany, 100 in the old Länder and 25 in the new Länder. In addition, there are 28 Fachhochschulen for public administration training civil servants (Peisert and Framhein, 1994).

The Fachhochschulen are predominantly teaching institutions aimed at preparing competent practitioners rather than future researchers. Agreement between Federal and Länder requires that the teaching be science based and application related. Consequently, teaching is
orientated toward the application of rigorous scientific methods in order to seek concrete solutions for practical problems and, in many cases, reflects vocational experience. Gaining methodological and problem solving competence is deemed more important than acquisition of factual knowledge (von Hoyningen-Huene, 1992). The range of curriculum is driven by the institutional mandate, is controlled by the respective federal state and focuses primarily on economic needs. Major fields of study are engineering, social work, business, art and design. Engineering is quantitatively the most important field. (Peisert and Framhein, 1994). The Fachhochschulen educate more than 70 per cent of all graduate engineers, 42 per cent of all graduates in economics and over 90 per cent of all graduates in social work (von Hoyningen-Huene, 1992):

The research mandate of the Fachhochschulen is evident in the federal Framework Act for Higher Education (1976), which gives the Fachhochschulen the responsibility of "fostering and developing science and the arts through research, teaching and study" (Section 2.1). For Hoyningen-Huene (1992), research and development projects are an integral part of the Fachhochschulen curricula, enabling students to transfer their skills to real world problems in project or thesis work. Technology transfer, regionally, nationally and internationally, is a key function of the Fachhochschulen due to the applied orientation of the institution, and is an important instrument of economic policy.

The Fachhochschulen focus on one credential, a Diplom degree with an FH designation, for example, Diplom Ingenieur (FH). The Fachhochschulen degree is connected to the job market and does not articulate well with the universities. Comparatively, a Diplom-(FH) can be ranked between a bachelor's and a master's degree, whereas a university Diplom corresponds to a master's degree (von Hoyningen-Huene, 1992). The Fachhochschulen
cannot confer doctoral degrees but continue to pursue that option. The duration of studies for the Diplom (FH) is federally legislated in the Framework Act (Art 10) at a maximum of four years. However the incorporation of one or two semesters of workplace based practical training has resulted in an extension to this standard period. On average studies at the Fachhochschulen require approximately four and half years compared with between six and seven years at university. For Jallade (1992), the length of a degree program is usually a good indicator of its academic prestige and marketable value. Polytechnic and university first degrees in the United Kingdom are both three years of study\(^4\), leading to comparable degrees albeit different in focus. This contrasts with Germany where university studies are significantly longer than those in the Fachhochschulen. Yet graduates of the Fachhochschulen, as a rule, are members of the same professional organisations as graduates of the universities and technical universities.

Access policies to the Fachhochschulen are constrained by the nationally defined uniformity characteristic of German higher education. Exit and entry levels are defined nationally; only students of demonstrated ability can gain admission. Currently there are two access routes to the Fachhochschulen both dependent on a secondary school examination. The initial target group was those secondary school graduates who did not have Abitur, the higher education entrance requirement but who had undergone vocational training, some even full apprenticeships and wanted to advance their careers. Lezczensky (1992) draws attention to the changing student profile and attributes the quantitative growth of the Fachhochschulen to students with Abitur who choose the Fachhochschulen in preference to university, largely because of shorter and more practical focused courses of study. Currently 60 percent of the students entering the Fachhochschulen have the Abitur (Peisert and Framhein, 1994). Interestingly, an increasing fraction of these “Abiturienten” are undergoing some vocational
training prior to entry (Leszczensky, 1992). In contrast to comparable institutions in other countries, opportunities for part-time study, particularly at the undergraduate level, are rare. Continuing education at the Fachhochschulen is primarily on a full time basis, culminating at the post-graduate level in advanced degrees or professional certification. Part-time continuing education programs are developed usually for employees of a specific enterprise in conjunction with that enterprise (von Hoyningen-Huene, 1992).

Leszczensky (1992) charges that increasing demands on knowledge content towards theories and concepts, coupled with a changing student profile, is resulting in a shift in focus away from the “craftsmanship” approach to practical work, and to accusations that the Fachhochschulen are succumbing to academic drift. However, he predicts the elimination of the binary system and convergence of the Fachhochschulen and the universities as unlikely. Since their establishment, the Fachhochschulen have gained increasing recognition and have moved from a position of uncertain identity to well defined positions within higher education. Leszczenksy refers to interesting findings of a study which indicate that many students who wished to study at a Fachhochschule are being forced to study at university instead due to lack of available places. Citing student demand and economic desirability, the Wissenschafstrat, Germany’s higher education planning body, has recommended expansion of the Fachhochschulen by 50,000 places (Leszczensky, 1992). Moreover, some Lander governments are indeed now confining further expansion of higher education to the Fachhochschulen (David, 1997).

The Berufsakademie

The general progression along the theoretical/practical knowledge continuum towards increased recognition of more practice-based technological knowledge to the baccalaureate
level is demonstrated in Germany's Berufsakademie. The Berufsakademie is a relatively new degree granting institution which is currently well established in only three German Lander, Baden-Wuerttemberg has nine institutions, Berlin has one and Sachsen has one. Single Berufsakademie exist in the Lander of Niedesachsen, Sachsen-Anhalt and Schleswig-Holstein but without the degree of institutionalization typical of the Berufsakademie in the former Lander. The Berufsakademie developed in response to employer demands for a more work oriented approach in higher education. In some occupational sectors university education was regarded as too theoretical with no practical experience, and the Fachhochschulen were perceived as succumbing to academic drift. Moreover, the Berufsakademie offered an alternative for the increasing proportion of school leavers with Abitur.

The Berufsakademie was established to provide an attractive alternative to existing institutions of higher learning. The Berufsakademie aims to offer a degree program which optimises the integration of theoretical knowledge with practical workplace experience. Consequently, the Berufsakademie has features in common with both Germany's dual system of learning and with the higher education sector. As in the dual system, students are employed by a company and must have a training contract with an employer prior to being admitted, the employers pay the students a training allowance, and the student alternates time at school with time in the company. However, in contrast to the dual system, first the alternate phases of course work and on the job training are of equal duration, normally 12 weeks, and second as the Berufsakademie has only been established in a few Lander, its curriculum or training ordinances are not legislated nationally. Rather, committees of curriculum development with equal representation of academics and employers determine the content and integration of theoretical with practical training. Commonalities with the higher
education sector define entrance and exit criteria. Admission requirements are the same as for university entrance. Students graduate with a degree designated Diploma (BA). The Berufsakademie boasts a very low attrition rate compared with universities, however, as this type of institution is not regarded as tertiary level in all states, national articulation to further studies is inhibited.

**Australia**

Australia, as a federal system, operates at three levels, Commonwealth (federal), state and local government. According to Harman (1989), Australia's whole tertiary education system has been influenced significantly by changing relations between state and federal governments. Australian usage of “tertiary education” refers to post-secondary education, whereas “higher education” is reserved for universities and former colleges of advanced education (Harman, 1989). At federation education was deemed a state responsibility. However, Smith and Wood (1992) concede a blurring of responsibilities between federal and state governments, and see a deliberate move in the 1980s from “soft federalism” to “hard federalism,” where the federal government has adopted a more assertive position on higher education than previously. This shift was attributed to the Commonwealth’s assessment of Australia’s economic problems and the need to attune higher education to workplace requirements. Explaining federal intervention, Smith and Wood draw attention to “a striking anomaly in Australian higher education” (p.97) where, with the exception of the Australian National University and the University of Canberra, the states retain legislative responsibility for higher education even though funding has been a federal responsibility since 1974. Subsequent to the Murray Report (1957) financing of higher education had been shared equally by state and Commonwealth.
As in other industrialised countries, acceptance and legitimisation of applied knowledge in Australia mirrored social and economic development. Patterns of development in Australia, however, were markedly different from established European societies, exhibiting the priorities of a newly settled colonial country. Specifically, the pioneering conditions imprinted a distinctive character on Australian education which prevailed until the mid 1950s (Barcan, 1980). Persistent shortage of labour meant education was not very important for economic and social advancement (Barcan, 1980; Wheelwright, 1965), consequently, education and particularly advanced education was often neglected. Other factors influencing educational development in Australia exhibit similarities with Canada and British Columbia. For example, uneven geographic distribution of population was a significant factor in educational reforms. Additionally, immigration of skilled labour, scientists and professional classes discouraged technical and higher education (Barcan 1980).

The advance of applied knowledge to baccalaureate status in Australia follows two distinct routes, through the university sector and through an evolving technical education system. Partial convergence of these sectors occurred in the move to the Australian Unified System in 1988. The trend towards recognition of applied knowledge in Australia is discussed within two time periods: from 1850 to 1950; and, post 1950.

**Between 1850 and 1950**

**The University Sector**

The character of Australian universities was moulded both by economic needs of the new society and by contemporary British models. In general Australian universities adopted a stronger vocational orientation than their British, German or Canadian counterparts.
The "older group" (Macmillan, 1968) of Australian universities, the universities of Sydney, established in 1850, Melbourne in 1853 and Adelaide in 1874, with Oxford, Cambridge and London as models, were founded largely on the liberal ideals of the medieval universities but at a time when reform of British universities was underway. Barcan (1980) notes the slow development of these institutions and sees this not only as a partial consequence of a sparse population, but more due to the practical outlook of pioneering society who saw little value in higher education. Unlike England, Australia did not have a leisured upper class for whom a liberal education was intended (Barcan, 1980), moreover, Australian society actively rejected the concept of a governing elite (Encel, 1965). MacMillan (1968) concurs, noting that even from the earliest years "the universities were never the bastions of social privilege" (p. 12). Rather, students were the sons of small farmers, tradesmen and craftsmen as well as landowners, professional men and high ranking public officials. Initially the new universities did not cater to the established professions. Preparation for the professions: law, medicine and theology, was accomplished in British universities or by "on the job" training in colonial solicitors offices, hospitals and theological colleges. However, Professor John Woolley, the first Principal of the University of Sydney, acknowledged the need for dualism:

The idea of a university is two-fold; it is first, what its name imports, a school of liberal and general knowledge and secondly a collection of special schools, devoted to the professions. Of these, the former is the University, properly so called. The second is complementary and ministerial. The former considers the learner as an end in himself, his perfection as a man simply being the object of his education. The latter proposes an end out of and beyond the learner, his dexterity namely as a professional man (Inaugural Address, cited in Macmillan, 1968, p.4).

According to MacMillan (1968), founders of universities had in some cases to convince contemporaries of the desirability of a university by emphasising the need for medical and other professional schools. Citing Professor Auchmuty he adds "it was sold to the community as a kind of superior technical college, not because that was the belief of the founders, but because it was the only way to get the Act through" (p.12). Encel (1965) notes that the
“service station” concept of the university was supported at varying times by both academic staff and governing lay boards. The University of Melbourne, aided by government endowment and fuelled by the gold rush, was the most successful of the colonial universities (Barcan, 1980), and took the lead in incorporating professional education into Australian higher education. The Faculty of Medicine was established in 1862, followed by the Faculty of Law in 1874. Degrees in science and engineering followed in 1883 (Barcan, 1980), in addition to diploma level studies in survey, metallurgy and architecture. The Universities of Sydney and Adelaide progressed more slowly. The Faculty of Arts at Sydney was augmented by Science and Medicine in 1883, while Adelaide introduced Law in 1883, Medicine in 1885 and Engineering in 1888.

Industrialisation in Australia came relatively late and, although the consequent rise of a new professional middle class occurred somewhat later than in Europe, the recognition of education as a means of social advancement was similar. The pioneering ethos, however, restricted interest in a humanist curriculum. Encel (1965), discussing the utilitarian or “instrumentalist” views versus the cultural approach to higher education, notes that “as far as Australia is concerned, the struggle between these two conceptions of higher education was decided quite early in the piece in favour of the instrumentalist view” (p.5). According to Barcan (1980), the education reforms of the early 1900s were related to changes in social class, in particular the growth of a new professional class prepared in the universities—which increased the importance of the universities.

The “middle” group (MacMillan, 1968) of universities was established between 1890 and 1912 as a result of public pressure on the state governments of Western Australia, Tasmania and Queensland which lacked universities. Reflecting innovations of the newly established
civic universities in the United Kingdom along with some American influences, the newly established Australian universities provided "a new emphasis on science education and "functional" studies, for example: medicine, mining, engineering and veterinary science; free instruction; part-time courses, and university extension courses" (MacMillan, 1968, p.11).

The next thirty years was a time of consolidation for the six universities. The development of the utilitarian function of higher education was evident as new faculties of architecture, economics and dentistry emerged in several universities (MacMillan, 1968). Rapid population growth resulted in the founding of two university colleges to supplement the universities: Canberra University College in 1929, affiliated with the University of Melbourne; and New England University College in 1938, affiliated with the University of Sydney. The New England University College gained autonomy as the University of New England in 1954, primarily because of its progressive approach to distance education through correspondence courses (Barcan, 1980).

Intensive industrial development during World War II underscored the demand for high level technological education. The establishment of the New South Wales University of Technology in 1949 recognised practice-based technological education to the degree level and introduced unusual features into the university curriculum, notably, requirements of extensive practical experience in industry (Macmillan, 1968). While providing baccalaureate status for technological education, a new technological university brought confusion and adverse effects. Diploma courses from the technical colleges were progressively transferred to the university and became part-time degree courses (Wood, 1965). Students were encouraged to enrol in degree rather than diploma courses. Barcan (1980) contends that loss of this vital link of diploma programs seriously weakened technical education in New South
Wales. The university was re-named the University of New South Wales in 1958 and gradually withdrew all existing diploma courses in favour of a six-year part-time B.Sc.(Tech.) credential (Wood, 1965).

Vocational preparation featured prominently in Australian universities. At the time of the Murray Committee (1957) there was a university in each state offering a wide range of degree and sub-degree vocational programs, with a high proportion of part-time students. Two thirds of the students were in the vocational faculties, more than half those in the arts faculties were pursuing a teaching vocation and there were very few research students (Williams, 1992). The Murray Committee was charged to “investigate the problems of Australian universities and suggest improvements” (Barcan, 1980, p.333). The subsequent Murray Report (1957) recommended relegation of all forms of non professional training to technical colleges, elimination of sub-degree level awards and a reduction of part-time students. The removal of sub-degree students from the universities underscored a need to strengthen higher education in the non-university sector. This became the focus of the Martin Committee in 1961.

Further recommendations of the Murray Report included significant expansion of the university sector and an increase in research students. According to Barcan (1980), quantitative expansion was accompanied by a change in the character of university degree studies during the 1950s. An increasing emphasis on vocational training pervaded the universities in response to student motivation. Vocations such as hospital management, real estate and journalism sought to legitimise their professional status by acquiring university degrees. Barcan (1980) charges that the newer universities readily became “service stations” providing training in any area of sufficient social demand:
With our new population university education must be vocational, with our new environment it must be very largely technological; and with the reliance of universities on public funds it must consider realistically the demands which the community makes upon it.\(^7\)

Currently some Australian universities offer Bachelor of Technology programs, for example Swinburne University of Technology, Griffiths University, and the Royal Melbourne Institute of Technology.

**Technical Education**

Paralleling the development of a university sector was the evolution of what Wheelwright (1965) disparagingly refers to as a “system” of technical education with “little order and purpose” (p.xxi). In partial explanation Murray-Smith (1965) points out that the tendency throughout Australian history for a persistent labour shortage has not only emphasised the importance of the skilled worker but, more importantly, has tended to obliterate the wide distinction in older countries between the skilled and the unskilled.

Many technological colleges had their origins in the Mechanics Institutes first established in Australia in 1827. Paradoxically, despite their founding role in technical education and the chronic shortage of skilled labour, a Technology Commission Survey (1869) of Mechanics Institutes revealed a lack in provision of practical technical or commercial instruction (Barcan, 1980). According to Murray-Smith (1965), the Mechanics Institutes were established more for moral than practical reasons, to provide “self improvement for the labouring classes” (p.173). Courses were offered on an ad hoc basis and with no particular application or relevance to industry. However, the Mechanics Institutes provided an organisational core from which the system of technical education developed. For example, Sydney and Brisbane Technical Colleges both evolved from Mechanics Institute evening
classes which has resulted in a “noxious tradition” associating technical education with part
time studies (Murray-Smith, 1965).

The development of technological education varied by state. Victoria and New South Wales
led the colonies, stimulated by the gold rushes and consequent implications for mining and
engineering technologies. The first technical institution in Australia was the School of Mines
at Ballarat in 1870, followed by Bendigo in 1873 and the Gordon Institute of Technology in
1885. According to Murray-Smith (1965), neither employers nor trade unions demonstrated
consistent support for technical education. Rather, initiatives for technical colleges came
from public-spirited men and from philanthropists, the strongest advocates being professional
men. Ely (1978) suggests “that the economic and governing elite were persuaded that the
production of a home grown skilled workforce was necessary for international survival”
(p.52). Murray-Smith contends that declining interest in technical education by wealthy men,
primarily due to the onset of the Labour movement, partly accounts for the decline of the
“image” of technical education in the 20th century.

Ely (1978) refers to the late 19th century as the “hey-day of technical education in Australia”
(p.53). However, sporadic development prior to this had resulted in a system of technical
education characterised by lack of order and purpose (Wheelwright, 1965). The system
lacked definitive policy, organised courses and recognised credentials. Colleges lacked
clearly defined aims; some were providing secondary education rather than technical
education. Complete absence of a secondary education system meant severe articulation
problems (Murray-Smith, 1965). Educational reforms of the early 20th century aimed for a
more cohesive system. Linkages were forged between industry and business and with
apprenticeship systems. Adoption of secondary schools as a state responsibility improved articulation.

Intense industrialisation due to both World Wars stimulated interest in technological education. However, the major development resulting from this occurred in the higher education sector with the creation of the New South Wales University of Technology in 1949 as described previously. Murray-Smith (1965) charges therefore, that “since 1912 there has been little fresh thinking about technical education in Australia” (p.189), but he sees technical education becoming a “most favoured topic” (p.190) for the first time in fifty years. Barcan (1980) draws attention to the relative neglect of technical education at the tertiary level until 1961, and in Wheelwright's (1965) opinion, “it is clear that the present situation is totally inadequate for the needs of a complex industrial society” (p. xvi).

**Post 1950: Expansion and Diversification**

The trend towards vocationalism in the university sector, the neglected state of technical education and increased social demand for post-secondary education prompted speculation regarding the future role of the universities and possible diversification of tertiary education in Australia. The Martin Committee (1961) was convened to “consider the pattern of tertiary education in relation to the needs and resources of Australia” (Barcan, 1980, p.339). A major step towards legitimation of applied knowledge to baccalaureate status stemmed from the Martin Report (1964) and the subsequent diversification of Australia's higher education system.
Colleges of Advanced Education

Colleges of Advanced Education, designed to fill a gap between the universities and the technical colleges (Harman, 1989), were created as a federal response to the report and heralded Commonwealth funding for technical training which, in Barcan’s (1980) opinion, was the main achievement of the Martin Report. Envisaged as self governing multi-purpose institutions (Williams, 1992), Colleges of Advanced Education embraced a range of institutions from the long established metropolitan institutes of technology and large multi-campus metropolitan colleges to the provincial colleges with their strong regional identities, and single purpose agricultural, teacher education, health and music colleges. Compared to universities, Colleges of Advanced Education were more geographically dispersed and less homogeneous in character. Originally conceived as “Diploma Colleges” (Barcan, 1980), the mission of the Colleges of Advanced Education was to provide vocationally oriented courses which would facilitate the direct application of knowledge to industry, business and society generally (Mahony, 1993; Seagren et al., 1989). Their focus was primarily teaching and initially were not funded for research.

While Martin originally conceived of a binary model with Colleges of Advanced Education catering to students of lower ability than undergraduates and offering courses only at the sub-degree level, the Wark Report (1966) implied equality with the universities:

Colleges of Advanced Education should aim to provide a range of education of a standard of excellence and richness of content at least equal to that of any sector of tertiary education in this country (p.24). 8

Degree granting status followed the report of the Wiltshire Committee (1969); and Australia’s binary system resembled that of the United Kingdom and Germany. A process of academic drift began. By 1972 the Colleges of Advanced Education offered a wide range of credentials: sub-degree courses (associate diploma, diploma); three and four year bachelor’s
degrees; post-graduate diploma and masters degrees; but not doctorates (Harman, 1989; Barcan, 1980). The blurring of the functions of universities and the Colleges of Advanced Education became evident to students who rejected the idea that the C.A.E.'s are inferior or second-rate and that the people in them are somehow not as worthy, simply because their studies may not be the same as university studies ... and predicted ... that universities will become even more elite institutions and the colleges of advanced education will become the place where "the masses" can gain tertiary education. Some C.A.E.'s will become indistinguishable from universities.9

In the two decades following the Martin Report, changes in society, the economy and knowledge itself increased the breadth and complexity of the demands on higher education. These demands were fuelled in part by increasing professionalism of occupations in health and the social sciences, applied sciences, management, and the arts (Mahony, 1993). The Colleges of Advanced Education absorbed a significant part of this growth and diversified their offerings to included programs traditionally provided by the universities, for example law, architecture, engineering and the humanities. Eventually only medicine, dentistry and veterinary science remained exclusive to the universities (Mahony, 1993). By the late 1970s, many of the larger Colleges of Advanced Education resembled universities. Approximately 70 percent of the students in Colleges of Advanced Education students enrolled in baccalaureate and post-graduate courses (Harman, 1989). According to Moses (1991), "once established, institutions (CAEs) strove to become like universities and to become universities. Staff wanted the same privileges, same pay, same nomenclature as university staff. Much energy was spent on changing the system ..." (p.160).

Considerable instability existed in the binary system as some Colleges of Advanced Education sought university status. Two state governments pre-empted any Commonwealth
directive and declared two institutes of technology to be universities. Western Australia
designated Curtin University of Technology in 1986 and New South Wales designated the
University of Technology, Sydney in 1987. In Mahony’s opinion, “after more than twenty
years the Australian binary system had reached a critical stage (p.469). McKinnon (1991)
concurred, adding that “when John Dawkins took over the Education portfolio in 1987 the
Australian higher education was ripe for review and probably change” (p.1).

Post-Binary Period: Consolidation

The Australian Unified System

A major structural change to the organization, funding and delivery of higher education in
Australia occurred in 1988 (Smith and Wood, 1992). Driven by economic and social
imperatives, Australia’s binary system was abolished in favour of a unified national system of
education. The “Dawkins reforms” reflecting the instrumental role of John Dawkins, Minister
of Employment, Education and Training, were designed to “improve quality and efficiency in
the system, and equity of access and improved outcomes” (Baldwin, 1991, p.9). Dawkins’
newly created portfolio reflected government’s intent to reform higher education in line with
economic reconstruction (Harman, 1989). A similar purpose marked the creation of British
Columbia’s Ministry of Skills, Training and Labour. Dawkins’ reform agenda paralleled the
strategic direction of other industrialized nations and responded to the identified drivers:
manpower needs; equity demands; increased efficiency; and, increased government and
societal input to the function of higher education institutions.

The most significant elements of the Dawkins reforms, which in turn lead to heightened
recognition of technological knowledge, include: the abolition of the binary system which
distinguished between universities and Colleges of Advanced Education, and replacement by
a unified national system of education; major consolidation of institutions through amalgamation to form fewer, larger units, which would receive federal funding on the basis of agreed “educational profiles “in terms of teaching and research; increased emphasis on science, technology and business studies, deemed crucial to economic growth and increased but competitive research funding allocation; reform of institutional governance and management structures focused on increasing institutional response rate to technological change; and, substantial increase in the provision of student places and measures to increase efficiency and effectiveness of the system (Harman, 1989).

The move from a binary model to the Unified National System, elevating the Colleges of Advanced Education to the university sector, was accomplished by “the amalgamation of institutions into a smaller number of large, more broadly-based universities” (Baldwin, 1991, p.39). University status, generally, was not conferred on the colleges. In the majority of cases, Australia’s Colleges of Advanced Education were incorporated and “disappeared” (Mahony, 1993) into an established university. Questions of primacy of power, coupled with different academic cultures, educational philosophy and values, and staff hiring criteria, have contributed to strong tensions which, in some cases, led to the failure of mergers and retreat to original status. Colleges not involved in cross-sectoral mergers, merged with other colleges and redesignation as a university was subject to assessment. Only seven Colleges of Advanced Education became universities in their own right, six of these had been Institutes of Technology. Mahony (1993) draws attention to the already established movement of this type of institution into the university system, and notes that “University of Technology development has been a strong feature of the post-binary system and with it equity of access to competitive research funding” (p.477). Contrasting Australia’s move to a unitary structure with that of the United Kingdom, Mahony (1993) notes the central role played by Australia’s
Chapter 2: Review of Literature

established universities. In the United Kingdom, redesignation of institutions occurred without amalgamation, which Mahony predicts will be less disruptive.

While the new directions in Dawkins' reconstruction of higher education parallels those of other industrialised nations, Harman (1989) points to the greater pace and extent of the changes in Australia compared with other countries. In apparent agreement, Mahony (1993) describes the changes and the institutional model adopted as "more revolutionary than evolutionary" (p.471). Harman (1989) attributes Dawkins' success in educational reforms to three factors, which show commonalties with the findings of this study. First is the personal characteristics of John Dawkins, specifically "his personal drive, his leadership, his ability in persuasion and his political skills" (p.9). Second is the consultative approach used, for example, the consultative strategy of a Green Paper, *Higher Education: A Discussion Paper* (1987) inviting feedback, prior to the publication of a White Paper, *Higher Education: A Policy Statement* (1988) establishing government policy. Third is strong support of the educational changes from key constituencies and major interest groups, such as cabinet, who perceived the reforms as an integral part of government economic policy, and business and community groups who interpreted the reforms as ending a decade of malaise in higher education (Harman, 1989). Predictably, Dawkins' reforms were criticised from within the higher education sector, largely because of the increase in federal control and the new funding policies.

The Technical and Further Education Sector

Unmet demands for higher education, coupled with the decline in the number of diploma and associate diploma offerings following the elevation of the Colleges of Advanced Education to the university sector (Baldwin, 1991), prompted government attention on the Technical and
Further Education (TAFE) sector. The TAFE sector, comprising colleges of technical and further education, short cycle institutions that did not grant degrees, had been finally recognised as a separate sector of tertiary education and received Commonwealth funding following the Kangan report in 1974 (Smart, 1992). Contemporary debate suggested that sub-degree programs should become the preserve of TAFE institutions and external to the university sector. While this parallels the Martin binary proposals of the 1960s, Mahony (1993) points to a significant difference. Currently TAFE institutions and the universities are forging articulated pathways between the sectors where TAFE studies are credited towards a degree. Government is encouraging the development of dual qualifications, integrated programs so that both a diploma and a degree could be earned after three to four years of post-secondary education. Specifically:

Dual qualifications are designed to link and to integrate two courses which are complementary. The two courses are combined so that elements of degree level education are linked to a vocational qualification which has relevance to the core studies of the degree.

The framework assumes that a dual qualification will integrate a TAFE qualification and a higher education award. This contrasts to the former binary period which lacked cooperation between the Colleges of Advanced Education and universities. Mahony predicts that lack of strong university-TAFE cooperation would result in “degrees being offered in new institutes of vocational education and the extra-university cycle will recommence” (p.481). Notably, he adds, “as it finalised its closure of a binary system of higher education, Australia was awakening a binary system of tertiary education” (p.482).

Canada

Canadian education has been shaped by geography, federalism, regionalism, language and culture (Jones, 1997a). Canada is a federation of ten provinces and two territories. In contrast
to Germany's interlocked federalism and Australia's progressive centralisation, Canada exhibits soft federalism; the federal government has no constitutional responsibility for education. The British North America Act (1867) Section 93 established education at all levels as the exclusive jurisdiction of provincial governments and the Constitution Act (1982) maintained this division of responsibility. Consequently, Canada does not have a "national system" of education. Rather, historical and cultural differences have resulted in each province having a unique network of structures and policies (Jones, 1997a). Skolnik (1992), however, identifies a "binary" system as common to all provincial systems, with a clear demarcation between degree and non-degree sectors. Eight provincial systems currently resemble the binary system envisaged in Australia's Martin Report (1964–65) which restricted the college sector to non-degree level work. However, recent developments in British Columbia and Alberta suggest evolving binary models more closely resembling Germany and the United Kingdom prior to 1992, with degree granting on both sides of the binary line. Provincial diversity means that the trend towards increased recognition and formal legitimation of applied knowledge to baccalaureate level is occurring by different means and at varying rates. While all provinces progressively incorporated professional education into their university sectors, provinces continue to differ in the legal status they accord practice-based technological knowledge.

**Between 1850 and 1950**

**The University Sector**

Like Australia, Canada's early higher education system was modelled on Britain. Despite their founding charters which authorised degrees in the respected professions of law, medicine and theology, the early universities established in Eastern Canada in the mid 19th century concentrated almost entirely on undergraduate programs in arts (Harris, 1976).
Professional education took place through apprenticeship, for example, by provincial law societies or through clerical or theological institutes which had nominal relationships with the university. Universities were providing certificate and diploma programs for the emerging professions but for the most part professional education occurred outside the universities. For example, both Ontario and Quebec established colleges devoted to agriculture, veterinary medicine, engineering, and pharmacy (Skolnik, 1990; Harris, 1976). These institutions became affiliated with a university within a few years of their establishment and the majority of them, ultimately, became faculties of the respective universities. By the late 19th century Skolnik (1990) reports a strong concern for practical studies.

The utilitarian versus liberal ideal of the universities was a matter of considerable debate in Eastern Canada in the early 20th century, as both laypersons and academics struggled to clarify and validate the strategic functions of a university. According to Harris (1976), by 1920 “so far as academic legitimacy was concerned, the position of engineering, agriculture, forestry, veterinary medicine and dentistry was now as firm as that of law, medicine and theology” (p.261). Moreover, he adds “nursing, social work and commerce were on the point of being admitted to the club” (p.261). During the inter-war years, professional and quasi-professional education featured more prominently in university offerings as public and institutional priorities went increasingly to the creation of new professional faculties (Moran, 1991). A detailed account of the development of professional education in British Columbia is given in Chapter Four. World War II added impetus to the instrumentalist approach to higher education and to technological training as opposed to professional education.
Technical Education

In Harris' (1976) opinion, one of the most striking features of the Canadian post-secondary scene in 1940 was the lack of institutions devoted to technical and vocational training. The spectrum of technical schools consisted of several agricultural schools throughout the country, a forest ranger school in Quebec and an institute of technology in Calgary, Alberta. Wilkinson (1980) attributes Canada's lack of emphasis on technical education to immigration of technicians and technologists from Europe, middle management from the United Kingdom and importation of most of her technology from the USA. Dennison and Gallagher (1986) point out that in some provinces, for example, Newfoundland, slow growth of formal technical and vocational education was due to a resource based economy.

The move to effectively establish technical training beyond high school dates from 1945 (Harris, 1976). Stimulated by the need for rehabilitation opportunities for war veterans, Ryerson Technical Institute (renamed Ryerson Polytechnical Institute in 1961) and the Manitoba Institute of Technology were established in 1948, followed by the New Brunswick Institute of Technology in 1949. Neither Newfoundland, Prince Edward Island nor Nova Scotia had established institutes of technology by 1960, however, the latter province had two vocational schools. New developments in the three most-western provinces were restricted to an agricultural school in Alberta and the establishment of the Saskatchewan Technical College. In 1960, except for a forest ranger school established in 1946, British Columbia provided no opportunities for technological training other than its high schools and university (Harris, 1976). Harris concludes that, despite considerable development of technical and vocational institutions between 1940 and 1960, it remained until the Technical and Vocational Act (1961) for any province to claim adequate provision for technological training as opposed to professional education.
According to Harris (1976), Ontario was “the only province to make a systematic attempt to provide for technical and technological training” (p.493), establishing seven institutions by 1960. These included: Ryerson Technical Institute which provided the leadership role; a Provincial Institute of Mining; a second business school at Hamilton; a Provincial Institute of Textiles which was later renamed the Hamilton Institute of Technology; the Lakehead Institute of Technology which was transformed into the Lakehead College of Arts, Science and Technology on its evolutionary path towards university status (Jones, 1997b); the Eastern and Western Ontario Institutes of Technology. Other components of the Ontario “system” included the Ontario College of Art, and a forest ranger school. While Ryerson offered multiple programs, all others were confined to engineering, business administration and one or two specialties (Harris, 1976).

Wilkinson (1980) attributes the success of the “Ryerson experiment” (p.31) and subsequent Provincial Institutes of Technology based on this model, to the interactions among diverse elements: a visionary principal who understood post-secondary technological education and its role in the provincial economy; the fortunate presence of key government administrators at times when evolutionary changes were necessary; and, the critical need to validate technological education at each stage of its development to an often sceptical post-secondary sector of education, notably those graduates of traditional universities with limited understanding of advanced technological education (Wilkinson, 1980). Distinct parallels are seen between these successful interactions and those which played a significant role in the creation of a Bachelor of Technology degree at BCIT.

Academic drift was apparent at Ryerson from the outset. Initially, the duration of diploma and certificate studies was from nine months to two years. By 1950, on the advice of advisory
committees, Ryerson was actively extending its programs to three years, triggering alarm and accusations of emulating traditional universities. In 1951 trades courses were transferred to the Provincial Institute of Trades, and Ryerson, by its own definition, was graduating technologists rather than technicians (Wilkinson, 1980). By the late 1960s, Ryerson was confronting identical problems to those which BCIT would confront a decade later. Efforts to differentiate itself from the newly created community colleges, the Colleges of Applied Arts and Technology, coupled with on going articulation problems with Canadian universities, led to a submission to the Wright Commission in 1969 and 1970 for degree granting status. Ryerson was granted authority to grant degrees in 1971, but restricted to Bachelor of Technology or Bachelor of Applied Arts designations. A Bachelor of Business Management was added in 1978 (Wilkinson, 1980). In 1993 Ryerson was accorded university status as Ryerson Polytechnic University (Jones, 1997b).

Post 1950: Educational Diversity

Watson (1992) contends that “if there has been one constant policy pre-occupation for Canadian higher education since the 1950s it has been with ‘access’” (p.110). Dennison and Gallagher (1986) saw the decade of the 1960s as “truly a ‘golden age’ for public education in Canada” (p.11) characterised by unprecedented growth, new institutions and an educational structure that “introduced new concepts of accessibility to higher or post-secondary education (p.11). Two major developments in the 1960s influenced the growth and acceptance of applied knowledge within the higher education sector. First, the Technical and Vocational Assistance Act (1960) marked a clear and aggressive cost sharing arrangement between federal and provincial governments for the development of technical education. The massive infusion of federal funding prompted a proliferation of technical and vocational institutions throughout the country, spawning institutions such as the Northern Alberta Institute of
Technology (Andrews et al., 1997), Saskatchewan Central Technical Institute and BCIT. Second, and arguably the most dramatic influence on the development of applied knowledge and of Canadian higher education in general subsequent to the drive for professional education in the early 20th century, was the broad commitment to social equity that fuelled the dramatic expansion and diversification of post-secondary education in the 1960s (Skolnik, 1990). However, the gains made by applied knowledge in Canada as a result of this expansion were not as immediate as those in the other countries reviewed in this study. Provincial governments responded differently to the shortage of post-secondary opportunities from the governments of the United Kingdom, Germany and Australia. These countries built on the twin foundations of existing universities and technical colleges. In Canada, however, the need for polytechnic education was not well recognised nor did Canada have the base in technological education to build on.

**Community Colleges**

Canada, like the United Kingdom, Germany and Australia, moved to a mass system of education primarily by the creation of short-cycle institutions in the non-university sector. However, Canada’s two year multi-purpose community colleges contrasted the binary models adopted by the United Kingdom, Germany and Australia, all of which had degree granting on each side of the binary line almost from the outset. The focus of community colleges was local, whereas the Polytechnics, the Fachhochschulen and the Colleges of Advanced Education were linked more to regional and national economies. However, as a result of their origins and individual mandates, community colleges focused on applied knowledge, albeit at sub-degree level, to varying extents. As Smith (1991a) points out, “the essential characteristic of the United States and Canadian systems in the absence of prestigious alternatives to universities at the post-secondary level” (p.13).
Community colleges were established in almost all provinces (Watson, 1992), and in most cases involved consolidation of established institutions. For example, Ontario's Colleges of Applied Arts and Technology embodied existing technical institutes and adult learning centres (Sheffield et al., 1982). Dennison and Gallagher (1986) note that imposition of the college model on the founding institutions "in no sense compromised their function" (p.37), and they retained a heavy emphasis on technical and vocational education. Two technical institutes became part of New Brunswick Community College, whereas in Nova Scotia "proliferation rather than consolidation" (Sheffield et al., 1982, p.40) was the norm, with the creation of specialist institutions. Of particular interest to this study, the University College of Cape Breton, formed from a merger of the Eastern Nova Scotia Institute of Technology and Xavier College, was granted authority to offer a Bachelor of Technology degree.

Watson (1992) contends that only in a very loose sense can one speak of provincial "systems" of education. In the majority of provinces, college and university sectors remain distinct. Quebec, alone, has a wholly integrated system where entrance to higher education is through the College d'Enseignement General et Professionel (CEGEP). British Columbia and Alberta have articulation agreements through university transfer programs for academic but not for applied programs. The terminal nature of career technical programs is the concern and focus of No Dead Ends (1993), the Report of the Task Force on Advanced Training to the Minister of Education and Training, Ontario. Despite commissions and task forces in most provinces charged to investigate articulation and forge a future vision for higher education, only British Columbia and Alberta have made significant advances towards increased recognition of practice-based applied knowledge through formal legitimation.
Chapter 2: Review of Literature

Alberta: New Applied Degrees

In 1995, the Alberta post-secondary system included four universities: Alberta, Calgary, Lethbridge andAthabasca; two technical institutes, the Northern Alberta Institute of Technology (NAIT), and the Southern Alberta Institute of Technology (SAIT); and 11 public colleges offering programs ranging from career, agricultural, fine arts and vocational programs to university transfer (Andrews, Holdaway and Mowat, 1997). Degree granting remained the preserve of the universities until 1994 when, responding to pressure from colleges and institutes and to the market demand for advanced credentials, the Ministry of Advanced Education and Career Development policy document, New Directions for Adult Learners in Alberta (1994), announced a demonstration project to offer a new credential, an applied degree, in public colleges and technical institutes.

The requirements for Alberta’s applied degree parallel those in BCIT’s Bachelor of Technology degree: it has a work experience component; the curriculum focuses on the attainment of clearly identified competencies; it is significantly different in structure and intent from most university programs; and, it is offered in subject areas that do not duplicate existing university degree programs. Moreover, like BCIT, Alberta resolved to protect its two year diploma and to structure degrees to maximise credit from diploma programs (MAECD, 1994). While the intent of affording baccalaureate status for practice-based applied knowledge was similar to British Columbia, the process of legitimation was markedly different. In contrast to British Columbia’s “bottom up” approach where individual institutions lobbied government for degree granting status, Alberta’s approach was a “top down” government directed pilot project and restricted to applied degrees (MAECD, 1994). Degree granting status was not conferred on the individual institutions, rather institutions were limited to offering specific degrees approved within the pilot project.
All colleges and institutes were invited to submit proposals for applied degrees according to specific guidelines. Arguments were to be based on assessment and distinct labour market need above the diploma level. Proposals were received in two stages, depending on the proposed implementation date. A total of eight programs in seven institutions received ministerial approval. Four applied degrees were announced in March 1995 for implementation in 1995–96 and four were announced in October 1995 for implementation in 1996-97 (Appendix 2A). Notably, all use the word “Applied” in their title. Alberta’s applied degree combines three years (six semesters) of formal academic instruction and one year (two semesters) of formally credited work experience, supported by industry. Within this framework, Mount Royal College and Grand Prairie College have opted for a continuous four year program, while other institutions have opted for a “two plus two” model that builds directly on related diplomas. The intent was to offer these programs on a full time basis, however, student demand in some areas demonstrated a clear preference for part time opportunities.

A key component of the Applied Degree Demonstration Project was the establishment of an independent Evaluation Advisory Committee with representation from government, institutes, industry and students and charged “to make recommendations to the Minister on the ability of a new credential, the applied degree, to effectively prepare Albertans for careers in a rapidly changing economy.” The Demonstration Project and its evaluation is scheduled to run over the course of six years, providing on going data to inform the future of applied degrees in Alberta.
Summary

Traditional tensions between pure and applied knowledge and consequent debate on what constitutes legitimate knowledge has resulted in a stratification of knowledge and the institutions offering that knowledge. Stratification of knowledge is overtly expressed in terms of credentials which have become a means of occupational and social mobility. A hierarchically stratified knowledge system is promoted and perpetuated by active boundary work, in many cases using credentials as exclusionary devices to demarcate and control access to specific knowledge areas. The allocation of status and gradual legitimation of applied knowledge is due largely to the identification of knowledge with power and culture and is inextricably linked with the social history of the country. The development of higher education in most industrialised societies reveals two major periods of significant advance in the legitimation of applied knowledge, each as a response to economic demand for an appropriately skilled workforce. The first was a consequence of industrialisation and the rise of the professional society in the late 19th and early 20th centuries. In the United Kingdom, Germany and Canada this led to a shift from the traditional liberal focus to acceptance of more utilitarian studies in the university sector, whereas Australia’s pioneering society had demanded a more functional focus in its universities from the outset. This first period legitimised what are now recognised as professional university studies, having very strong theoretical underpinnings. In contrast, the second significant thrust legitimised practice-based technological knowledge, and occurred as a result of the 1960s expansion and diversification of higher education systems, particularly the non-university sector. In the United Kingdom, Germany and Australia consolidation of smaller vocationally oriented institutions into larger employment focused institutions, the Polytechnics, the Fachhochschulen and the Colleges of Advanced Education respectively, each with baccalaureate status, constituted binary systems
with degree granting on each side of the binary line. Comparatively, Canada restricted degree status to the university sector. Community colleges and institutes offered technological education at the sub-degree level until the mid 1990s when British Columbia and Alberta pioneered practice-based applied degrees in the non-university sector.

Footnotes

1 Rectoral Address to the University of St. Andrews, 1867
2 Interview with a university student as part of a research study cited in Brown and Scase, 1994, p.69.
4 Polytechnic degrees in the United Kingdom typically add a "sandwich" year in industry to the three years of formal study, resulting in a four year program. The sandwich year usually forms the third year of the program.
5 Information on the Berusakademie results from the researchers visit to the Berufsakademie, Karlsruhe in 1994, and discussions with Axel Gohringer, Direktor. This visit was part of an educational tour of Germany's employment-focused post-secondary institutions.
6 Andrae Wolter, Technical University, Dresden to Ann McArthur: E-mail, October 22 1997
7 Address by Dr. R.B. Madgwick, Vice Chancellor, University of New England, 1954.
11 Joan Cashion, Head, Industrial Sciences Department, Swinburne University of Technology to Ann McArthur: E-mail, July 10, 1997.
12 Swinburne University of Technology Administrative Guides. Section 7.6.
16 Terms of Reference of the Evaluation Advisory Committee of Alberta's Applied Demonstration Project.
Chapter Three: Methodology
This chapter introduces case study methodology and depicts this investigation as a historical and unique case study. The chapter discusses the rationale for choice of BCIT as the research site. The techniques of data collection through, participant observation, documents and archival records, and interviews are described. The criteria for choice of informants is detailed. The method of data analysis is presented and the validity, reliability and limitations of the study are outlined.

**Research Design**

The study follows a case study approach embedded within a qualitative research paradigm. Merriam (1988) describes a qualitative case study as “an intensive, holistic description and analysis of a bounded phenomena such as a program, an institution, a person or a social unit” (p.xiv). Merriam (1988) compares a research design to an architectural blueprint in that it is a plan for assembling, organizing and integrating information (data) and it results in a specific end product (research findings). The selection of a particular design is determined by how the problem is shaped, by the questions it raises, and by the type of end product desired. The case study is particularly suited to this investigation as the study will entail a significant historical component as a backdrop to the current investigation. The approach to this study typifies that of qualitative inquiry; it focuses on process, and seeks understanding and explanation. This study does not test theory, but seeks patterns and threads in the data and uses the literature more as a conceptual template for comparison. A qualitative approach asks questions to determine the meaning of an experience. Yin (1984) asserts that “how” and “why” questions favour the use of case studies, histories or experimental designs and distinguishes between these by the amount of control the researcher has over behavioural events. Case study is preferred in examining contemporary events. It relies on the same
techniques as history but adds a further two sources of evidence, direct observation and systematic interviewing. Collins and Noblit (1978) assert case studies which they call field studies “are better able to assess social change more than positivistic designs, and change is often what policy is addressing” (p.26). The research questions of this study seek evidence of social change.

This study is a historical case study. It represents a unique case. It exhibits the four characteristics deemed essential properties of a qualitative case study by Merriam (1988): it is particularistic, focusing on a particular phenomenon; it is descriptive, the text is a rich, holistic description of the case; it is heuristic providing deeper understanding, new insights and a rethinking of how and why things happened; it relies on inductive reasoning.

Tosh (1991) asserts that, “we know that we cannot understand a situation in life without some perception of where it fits into a continuing process or whether it happened before” (p.1). Abrams (1982) concurs that, “the present needs to be understood as a product of the past” (p.1) ...moreover that “the past is not just the womb of the present but the only raw material out of which the present can be constructed” (p.8). However, Abrams points out that merely recognising historical background is insufficient, rather a detailed-examination of the action of individuals on social structure and vice versa is required. Historical case studies distinguish between technique and account (Merriam, 1988). This study uses techniques common to historiography, specifically the use of primary source material. Similarly, it amasses evidence from multiple sources, so that inaccuracies and distortions are more likely revealed. Historical case studies are distinguished by the nature of the account. Typically description and narrative have been favoured in fields such as education (Merriam, 1988) however narrative as a literary technique imposes severe limitations on an attempt at
historical explanation and the treatment of cause. The multiple nature of causation demands that narrative be suspended (Tosh, 1991) and that an analytical technique be used where the outline of events is taken for granted.

This study adopted flexible use of narrative and analytical modes, sometimes in alternating sections and sometimes fused through the text. Analysis enabled portrayal of the connectedness of economic, social and political factors, occurring simultaneously, that contributed to the case. Narrative enabled holistic description of the case from a historical perspective.

The general research problem in this study is the legitimation of applied knowledge. The case is the creation of a Bachelor of Technology degree at BCIT.

**Research Site**

The site for this study is the British Columbia Institute of Technology, (BCIT).

BCIT was created in 1964 to fill a gap in the education system and to address the need for highly skilled technology graduates. The Institute mandate at the time was stated by Leslie Peterson, the Minister of Education:

> The aim of the British Columbia Institute of Technology will be to fit the latent skills and technical capabilities of our young people to the present and future needs of our province and indeed our nation.

The choice of BCIT for this study is threefold. First, as an institution BCIT is unique. Since the amalgamation with the Pacific Vocational Institute in 1985, BCIT is perhaps the most comprehensive technical institution in Canada, with programs spanning trades
apprenticeships to advanced technology baccalaureate level and post baccalaureate specialty programs. Unlike other post-secondary institution in British Columbia, BCIT focuses solely on practice-based applied education. This provides a distinct advantage in its use as a case for this study. Legitimising BCIT as a degree granting institution inherently legitimised practice-based applied knowledge. Consequently, the enabling and constraining factors which interplayed as BCIT sought degree granting status are simultaneously responsible for recognising technological knowledge to the baccalaureate level in British Columbia. Such parallels could not be drawn in a university college where some applied technical degrees are now also offered. The presence of academic programs in the latter, some previously at the degree level through partnerships with a university, suggests that academic drift may present an extraneous variable confounding a direct relationship between legitimation of the institution and legitimation of applied knowledge.

Second, the process of legitimation was unique. BCIT sought degree granting individually as an institution using a “bottom up” approach. Boundary workers lobbied all sectors of educational, corporate and government sectors to solicit support for a practice-based technology degree, culminating in a proposal from BCIT to the Ministry of Advanced Education, Training and Technology. This process contrasts sharply to other jurisdictions, for example, the United Kingdom, Germany and Australia, where technological knowledge gained baccalaureate status two decades earlier. In these cases, new technical degree granting institutions in the non-university sector were legislated on a system wide basis as part of the move to a mass education system which characterised the 1960s. While the non-university sector in Canada expanded during this period, it remained a unitary education system. In 1995, the Alberta government used a similar “top-down” approach to introduce applied degrees into their non-university sector as they designated individual degrees to specific
institutions on a pilot basis. A further reason for the choice of BCIT as a site is the familiarity of the researcher with the culture of the institution and specifically the degree granting initiative. This is detailed in the section on Participant Observation.

BCIT initially sought degree granting status fifteen years ago but was unsuccessful. A description and understanding of events during this time period provides a contextual background for the recent legislated baccalaureate recognition of technological knowledge. Access to the site was gained by writing to the president of BCIT. The letter stated the intent of the research and requested access to pertinent documents and permission to ask identified personnel for interviews (Appendix 3A).

**Data Collection**

Yin (1984) states that "evidence for case studies may come from six sources: documents, archival records, interviews, direct observation, participant observation and physical artifacts" (p.78). This study relied primarily on four sources of data, participant observation, documents, archival records and interviews.

**Participant Observation**

This study is a natural outcome of my intimate involvement in the development of a Bachelor of Technology degree at BCIT. Reflexivity implies that as we are a part of the social world we cannot avoid having an effect on the social phenomena we study and, furthermore that "the orientations of researchers will be shaped by their socio-historical locations including the values and interests those locations confer upon them" (Hammersley and Atkinson, 1995, p.16). Consequently, research findings will be unavoidably affected by the social background
and personal characteristics of the researcher. I therefore acknowledge and document my participation in the BCIT’s Bachelor of Technology degree initiative. My involvement has progressed through distinct stages over the past six years, each with a different focus, beginning as a result of my being Chair of BCIT’s Education Council from 1990–1992. This was a time of significant change in the post-secondary system of British Columbia. Specifically, the “Access for All” (1989) initiative was advocating the creation of degree granting institutions in the non-university sector. I was asked by the President of BCIT to prepare, first, a Discussion Paper providing a rationale for a practice-based technology degree at BCIT, and later, a formal proposal to the Ministry of Advanced Education, Training and Technology soliciting approval for such a degree. In preparing these documents I researched literature, predominantly policy documents, held discussions with various individuals and stakeholder groups both internal and external to BCIT and visited several polytechnic institutions in the United Kingdom as I sought opinion and rationale to present BCIT’s case. A detailed account of these events is given in Chapter Six.

Following the submission of a Proposal for a Technology Degree at BCIT (June 1992) to the Ministry and having received positive, albeit informal, feedback the focus of my involvement shifted to planning implementation procedures for degree programs. I was assigned by the Vice President, Education to develop a Quality Assurance process to validate and subsequently review all BCIT degrees. My work required researching established processes and formulating a model appropriate to the organisational structure and culture of BCIT. Ultimately this involved liaising with the Ministry as the provincial validation process was established. Throughout this time I continued to speak with individuals and groups about the Bachelor of Technology degree. I met with the Board of Governors, Advisory Committees, Ministry officials, faculty, management groups, alumni, and students. My role was of
informant and advocate as I endeavoured to encourage support and address concerns by
demonstrating how the philosophy and unique model of the degree responded to graduate,
employer and labour market demands. By this time I was strongly identified with the degree
initiative and my interactions ranged from casual coffee time conversations to scheduled
presentations and forums. In October 1992, I became involved in issues related to degree
granting institutions in the non-university sector at the provincial level when I was appointed
to the Carter Committee on Governance of Colleges and Institutes. The nature of my
participation in BCIT’s Bachelor of Technology degree initiative changed yet again following
the enabling legislation in January 1995. My prime responsibility now is coordinating the
preparation of Bachelor of Technology degree proposals and facilitating their passage
through BCIT’s internal quality assurance process and through the provincial validation
process.

Glesne and Peshkin (1992) note that “participant observation ranges across a continuum from
mostly observation to mostly participation ... although your actual participant-observer role
may fall at any point along this continuum you will most likely find yourself at different
points at different times in the data collection process” (p.40). This research study marks a
point in my involvement with BCIT’s Bachelor of Technology degree where I move from one
extreme of the participant-observer continuum as a full participant, to assume a role of
disinterested observer, a stance from which I now look back and ask “What really
happened?...Why was this venture successful?” From the vantage point of observer I
recognised that my original assumptions of why the technology degree initiative was
successful were somewhat idealistic and flawed. The arguments we had mounted were
educationally based, success however, was predominantly politically based.
Documents and Archival Records

Documentation and archival records were used to reconstruct the history, the economic, social and political contexts, procedural events and evidence of both internal and external forces. Documents originating from the federal and provincial governments identified trends and policy directions. Specifically, the following types of document were reviewed:

(1) strategic planning and task force reports, with an institutional or provincial focus;
(2) provincial and federal government reports; (3) minutes of meetings, in particular BCIT Education Council and BCIT Board of Governors; (4) letters, memos and printed copies of electronic mail messages circulated among stakeholders. While this documentation was a rich source of information, it also provoked many unanswered questions. Throughout the primary document, research questions were noted in a field note book, assigning each to potential informant(s) who may best inform the question. In some cases, the questions filled gaps in the history and in others provided interpretations of events.

Interviews

Information in written form has limitations. Some of it, particularly philosophical and political aspects, can be learned only by talking with others. Evidence was therefore augmented by interviews of key personnel representing different stakeholder groups. The sampling technique for this study was purposeful, not random. Purposeful sampling is based on the assumption that one wants to discover, understand, gain insight; therefore one needs to select a sample from which one can learn the most (Merriam 1988). Because of my role at BCIT and specifically my involvement role in the degree initiative, I relied initially on my own judgement to determine which stakeholder groups should be represented and to identify potential informants within these groups. Primary document research both suggested
additional informants and confirmed some of my choices. Merriam (1988) suggests asking a key person for recommendations as to who should be interviewed. Advice was sought from BCIT’s former Vice President, Education and now current President, regarding the selection of relevant informants. He proposed two additional informants and gave guidance on the choice of others. In two instances informants themselves suggested other potential informants who might contribute to the study.

Participants
The participants represented a “purposeful sample.” It was essential to select people who could best inform the research question and provide perspectives from diverse stakeholder groups. The following stakeholder groups were represented in the sample: government, corporate sector, university sector, professional association of technicians and technologists of British Columbia, BCIT alumni, BCIT Board of Governors, BCIT advisory committees, BCIT faculty, management and senior administration. While each informant was selected primarily as a representative of one particular stakeholder group, five interviewees were associated with more than one stakeholder group. This proved an added bonus in the interview process.

The final interview sample included: (1) four key members of government at the time of BCIT’s bid for degree granting status. A Minister and a Deputy Minister responsible for post-secondary education were selected because of their respective roles in the decision making process to grant BCIT baccalaureate status and to provide input on the vision and direction of government policy for post-secondary education at that time. An Assistant Deputy Minister and a Director of Universities and Provincial Institutions were chosen because they provided the closest operational and communication linkages between BCIT and the provincial
government on a day to day basis; (2) three members of the corporate sector selected largely because of their multiple roles with respect to BCIT. Two were recent members of the Board of Governors. The former Chair of the Board of Governors was selected because of his leadership role, on behalf of the Board, in the degree initiative. The interview uncovered that this informant was also a former advisory committee member and BCIT alumnus. The second Board member was selected partly for his demonstrated contribution and vision as a Board member but more because, as president of a large international engineering firm employing BCIT graduates, he provided a global industry perspective. This informant had served on advisory committees in the mid 1980s. The third corporate representative was a current advisory committee member who is also involved in the validation process of BCIT degrees. The interview determined this informant was also a BCIT alumnus; (3) one Vice President, Academic from the university sector selected to input a university perspective on both the concept of degree granting outside the university sector and baccalaureate status for practice-based technological knowledge. The particular choice of informant from this sector rested both on his historical association with BCIT in exploring possible collaborative degree partnerships, and his current involvement in the provincial degree validation process; (4) current Executive Director of the Applied Scientists, Technologists and Technicians of British Columbia (ASTT), selected to inform the research question from the perspectives of the profession and the individual technologist. Inclusion of this informant was prompted by primary document research which highlighted significant involvement of ASTT, specifically this individual, to the previous degree initiative and furthermore, identified him as a former member of BCIT's Board of Governors. The interview process revealed his additional affiliations as a former advisory committee member and BCIT alumnus; (5) four members of BCIT's senior administration including two past presidents, current president formerly Vice President, Education and one past Vice President, Education. These four informants
represented the two senior administrators spearheading the respective degree initiatives of the 1980s and the 1990s. Selection of these interviewees enabled exploration of key issues at both times from historical, political and institutional perspective; (6) three members of BCIT's management team including two deans and one former associate dean. Criteria for selection of two of BCIT's six deans was based on the history of the involvement of their schools in post diploma education. Both schools had developed Advanced Diploma Programs, wrestled with potential collaborative degree partnerships with the traditional universities and offered collaborative degrees with the Open Learning Agency (OLA). Furthermore, both schools had significant involvement in advanced studies through distance learning. The choice of the associate dean was made primarily because her specific program pioneered post diploma studies, advanced diplomas and collaborative degrees. She had been intimately involved with the negotiations for transfer credit and/or collaborative programs with the universities throughout the 1980s and could provide insight to obstacles and barriers encountered; (7) two faculty members. The choice of two individuals to inform the research questions from a faculty perspective became apparent during the primary document research which highlighted their long involvement with BCIT in roles requiring keen awareness of institutional issues. Both have strong ties to the BCIT Staff Society, and both were involved in the 1980s degree granting initiative, one as a member of the Board of Governors and the other as President of the Staff Society. Furthermore, in the past three years, one member has coordinated and championed one of BCIT's new technology degree programs. Criteria for selection, particularly of internal informants, to represent specific stakeholder groups reflect Spradley's (1979) requirement of "thorough enculture" (p.46) for good informants. A list of informants is given in Appendix 3B.
Chapter Three: Methodology

Ethics and Confidentiality

The design of the study required meeting the university's requirements for conducting research with human subjects. Letters seeking informed consent were sent to eighteen potential informants. (Appendix 3C). However, ensuring an ethical study involves more than conforming to a bureaucratic requirement. Merriam (1988) reminds us that:

the burden of producing a study that has been conducted and disseminated in an ethical manner lies with the individual investigator.....The best that an individual researcher can do is to be conscious of the ethical issues that pervade the research process, from conceptualising the problem to disseminating the findings (p.184).

Furthermore:

Where research involves the acquisition of material and information transferred on the assumption of trust between persons, it is axiomatic that the rights, interests, and sensitivities of those studied must be safeguarded (Principles of Professional Responsibility, 1971 para. 1, a).

Ethical and validity considerations were addressed by requesting informants review transcripts of their interviews (Appendix 3D). Informants had the opportunity both to delete material they preferred not be used and to confirm the accuracy of the data. None of the informants deleted data; several informants embellished or clarified data.

Ensuring confidentiality of informants was fraught with difficulties. The informants were assured that their names would not be used but data they volunteered would be identified in general terms by the positions they held with respect to BCIT or in government. Given that there were a finite number of persons in such positions, coupled with a clear indication of particular time periods, absolute confidentiality was elusive. Moreover, the majority of informants held key positions in their representative stakeholder group which would make their comments more credible if these roles were revealed. By using more general identifying terms, for example "government official," meant that analytic credibility was being sacrificed.
for the sake of confidentiality. The informants were therefore contacted again (Appendix 3E), requesting permission to identify their positions more specifically within the text of the study and to list them by name as participants. Quotes attributed to individual informants, to be included in the study, were forwarded to informants at their request for approval. All informants agreed to be identified as suggested by the researcher and acknowledged as participants in the study.

Interview Process

Informants were first contacted by letter outlining the intent of the research and requesting their participation. A follow up phone call approximately one week later provided an opportunity to answer questions and provide further detail on the study. All informants approached agreed to participate in the study. All interviews were held at locations and times suggested by the informant. Thirteen interviews were held in the informants place of work, eleven in the office of the informant and two in small boardrooms. Coincidentally in all cases the informant indicated that a round table was to be used for the interview process. While Glesne and Peshkin (1992) maintain that “in most instances the researcher maintains a dominant role that reflects his or her definition of the inquiry purpose” (p.82), Oakley (1981) asserts that “interviewing is best achieved when the relationship of interviewer and interviewee is non-hierarchial” (p.41). Using a round table helped minimise potential hierarchial relationships and resulted in a relaxed conversational atmosphere. In contrast, one interview was held in my office. I sat at my desk and the informant sat on the opposite side. Here a power relationship was much more evident resulting in a more stilted interview process. Two interviews were held in hotels, one in the lobby and one by the pool. One interview took place on a park bench outside the interviewee’s workplace. In all three of
these locations extraneous noise detracted from the focus of the interview process and later inhibited transcription of some of the interview data. One interview took place in the living room of the informant's home, promoting easy dialogue.

Interview data were recorded using two tape recorders to guard against malfunction of one machine. Furthermore, one tape recorder was started approximately five minutes after the other to avoid missed dialogue at the end of a tape. In addition I took notes of key points and noted any body language during the interview process. The length of the interviews varied from forty-five minutes to one hour. Occasionally the conversation carried on beyond the one hour limit and after the tape was finished. This was a relaxed conversation, reflecting the interest of both parties in the subject matter, and seemed a natural outcome of the interview process.

A pilot interview was held with the current President of BCIT, who in his former position as Vice President, Education had championed the successful degree granting initiative. This interview was invaluable on two counts. First, it provided detailed information and suggested other sources of information to inform the research study, and second, it heightened my awareness of specific research techniques. Glesne and Peshkin (1992) attest to the "value of being naive" (p. 80) as a researcher and caution that one hazard of conducting research on a topic about which you know a great deal through study and personal experience, is that assumptions may preclude seeking explanations and in depth probing. I acknowledge that I had worked closely with this informant during the past four years specifically on the degree initiative, however perhaps due his own research expertise, the informant assumed my total
naivety and answered questions providing details of which he knew I was well aware. I was alerted that I would need to feign deliberate naivety with other informants.

Each interview began by ensuring that the informant understood the purpose and scope of the study and re-iterating the specific research questions. This information had been provided on the letter of consent that was signed prior to the interview. Glesne and Peshkin (1992) advise that questions must be anchored in the cultural reality of the respondents (p.66).

Consequently, while there were similarities in the structure of the interviews, each interview was a unique event necessarily because of the different roles played by informants. Some informants were able to add significant historical information while others provided key political insights. In some instances informants with multiple affiliations with BCIT were asked to "change hats," for example from a board member to an alumnus and answer a question from a different cultural context. All interviews had an open ended format but all interviews addressed the specific research questions pertaining to enabling and constraining factors influencing BCIT's degree initiative. Sometimes answers to the research questions evolved in the natural flow of conversation. In such cases I sought confirmation by asking, "are you saying...," and prior to the conclusion of the interview I restated factors identified already and asked the informants if there were additional ones. Spradley (1979) advocates that interviewing involves two distinct but complementary processes, developing rapport and eliciting information. The initial interaction in the interview process was deliberately constructed to establish a comfort level and encourage the informant to speak freely. Each interview began with descriptive "grand tour" questions (Spradley, 1979, p.86). For example, informants were first asked to describe their role and association with BCIT and then to describe their involvement in the degree initiative. The open ended interview format makes it difficult to give examples of common questions. However, I asked all informants if they
perceived that, in legislating BCIT's authority to offer Bachelor of Technology degrees, government had differentiated between the legitimation of practice-based technological knowledge and legitimation of the institution. Interviews had a very conversational tone. Sometimes informants were enjoying reminiscing and it became necessary to redirect the flow of conversation.

Interview questions originated from diverse sources. Consistent with Glesne and Peshkin's suggestion that "the experience of learning as participant observer...is the basis for forming questions" (p.65), my involvement with the degree initiative over the past five years had evoked questions of historical, political and social influences. Primary document research also generated interview questions, some as a result of ambiguities and others requiring more in-depth knowledge than provided in the documentation. On going analysis of interview data begat further questions to pose to other informants.

Interaction of personalities has a profound effect on interviews (Spradley, 1979), consequently establishing rapport between researcher and informant is an integral part of collecting data. Glesne and Peshkin (1992) assert the rapport indicates confidence and trust, and is a necessary but not sufficient condition for obtaining good data. I experienced good rapport with all informants. Fifteen of the informants were well known to me and a certain rapport already existed. Commonalities of culture and purpose made it relatively easy to create a rapport with the remaining three informants. Glesne and Peshkin report that "rapport comes when the interviewee gets something out of the interview" (p.96). Prior to the study I was concerned that some interviewees may be influenced by their perception of my current role within the institution. This fear appears unfounded; all participants seemed be to speak willingly, were forthright in their answers and seemed to enjoy their involvement in the
process. Several informants remarked that degree granting marked a significant milestone in BCIT’s history and they were pleased that this study was being done. All participants volunteered they be contacted again if further information was required.

Data Analysis

Data collection and data analysis occurred simultaneously. In this way analysis informed further data collection. Data were analysed in three distinct stages. First, primary source documents were analyzed, providing a historical framework for the study. A chronological perspective of events and documents was captured by displaying data in matrix format using different coloured “post it” notes on a wall chart. Questions of clarification or interpretation arising from the analysis of primary material were noted in a research journal and assigned to one or more informant who could best inform the question. Second, the interviews were analyzed. Each interview was transcribed verbatim using a transcribing machine with headphones and a foot pedal. Data were recorded using only the left half of each sheet of paper to enable coding of data on the right half of the page. Lines and pages were numbered for easy reference. Interviews were analyzed in groups of three or four as they were transcribed. Each interview was read completely and then read a second time assigning preliminary codes to the data.

When all interviews had been transcribed I spent several hours totally immersed in the interview data. All interview transcripts were read consecutively and, through a process of reflection and visualisation, emergent dominant themes were identified. Mind mapping was used to relate dominant themes and sub themes. A legal sized piece of paper was used for each theme and sub theme, and supporting interview data was referenced using the page and
line numbers from the relevant transcripts. In addition to informing the research questions, the interviews provided personal anecdotes that both embellished and enriched the historical component of the study.

The final stage of analysis was the analysis of secondary material. Documented confirmation of interview data was recorded on “post it” notes and attached to the legal sized page dealing with that particular sub theme. Ideas and insights are often fleeting. Throughout the study a tape recorder was kept close by to capture such thoughts. Occasionally, insights occurred which may warrant exploration in the concluding chapter of the study. These were noted and collected in a file folder.

**Validation and Reliability**

This study uses traditional constructs of validation and reliability to frame discussion on the trustworthiness of the study. However, as case study research is interpretive, seeking understanding of events or phenomena, and the researcher is interested in perspectives rather than truth per se (Taylor and Bogdan, 1984, p.98), alternate constructs more suited to qualitative work (Krefting, 1991; Lincoln and Guba, 1985) are embedded within this framework.

**Internal Validity**

Conventionally, internal validity deals with how one’s findings match reality. Given that case study work attempts to capture and portray the world as it appears to people in it and what “seems” to be true is more important then what is true (Walker, 1980 p.45 cited in Merriam), trustworthiness is established through a process of verification. Lincoln and Guba (1985)
offer **credibility** as a more appropriate descriptor for qualitative studies. This study uses the following strategies to enhance credibility: prolonged and varied field experiences, triangulation, member checks, interview techniques, authorization of the researcher, reflexivity.

Krefting (1991) suggests that credibility requires adequate submersion in the research setting to enable recurrent patterns to be identified. Owen (1996) maintains that “prolonged engagement promotes increase of rapport which leads to more information and more sensitive information being made available, and it allows one to detect patterns of responses that suggest informants are responding with what they think are the socially preferred responses” (p.81). My long association with BCIT, and more specifically the various roles I played during my six year participation in the degree initiative, gave me access to many archival documents and correspondence that others may not have known existed. Furthermore, over this time I had built a rapport with many informants. Krefting (1991 citing Miles and Huberman, 1984) advocates that “the essence of the credibility issue is the unique authority of the researcher, the ‘I was there’ element” (p.220). Other elements enhancing my authority include: the degree of familiarity with BCIT and with the post-secondary system as a result of my various responsibilities; investigative skills and knowledge developed through literature review, course work and research; comparative background knowledge in which to situate this study, gained from visiting similar institutions in Germany and the United Kingdom.

Reflexivity pertains to the influences of the researcher’s own background, perceptions and interests. Credibility necessitates acknowledgement and clarification of the researcher’s bias.
My role as researcher and potential bias have been articulated in this chapter under Participant Observation.

Triangulation refers to the cross checking of data from multiple sources for mutual confirmation of findings. The primary sources of data were interviews and document and archival records analysis. However my role as participant observer provided a holistic overview for additional verification.

Member checks refers to a strategy verifying data and interpretation with people from whom they were derived (Lincoln and Guba, 1985). This study used member checks in two ways. First, interview transcripts were returned to informants to verify accurate translation of viewpoints and second, narrative accounts were checked for historical accuracy and interpretation by two senior and long time members of the BCIT community. Credibility was enhanced within the interview process by reframing and expanding on questions (Krefting, 1991, p.220). Also information provided by one informant was checked with a subsequent informant.

**External Validity**

External validity is concerned, traditionally, with the extent to which the findings of the study can be applied to other studies. This proves problematic in case studies. As Merriam (1988) notes, “One selects a case study because one wants to understand the particular in depth not because one wants to know what is true of many” (p.173). Lincoln and Guba (1985), using a more qualitative construct, transferability, argue that it is not the researcher’s job to provide an index of transferability, but rather to provide an adequate data base to allow others to make transfer judgements, and that as long as the researcher has provided sufficient
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descriptive data she has addressed the problem of transferability. The primary strategy used in this study to ensure external validity is the provision of a dense, holistic description of the study, so that anyone interested in its transferability will have a solid framework for comparison.

Reliability

Conventionally, reliability refers to the extent to which the findings of the study can be replicated. However, this logic relies on repetition for the establishment of “truth.” Lincoln and Guba (1985) suggest more appropriate constructs of dependability and consistency of results obtained from data so that “rather than demanding that outsiders get the same results, one wishes outsiders to concur that, given the data collected, the results make sense — they are consistent and dependable” (Merriam, 1988, p.172). Three techniques were used in this study to ensure reliability. First, a dense account was provided of the focus of the study, the researcher’s role, criteria for selection of individual informants and the context from which the data was gathered. Second, triangulating the multiple data sources strengthened the reliability as internal validity. Third, a detailed reporting of data collection and analysis was given to furnish a clear picture of the research methods.

Limitations of The Study

Case study research is subjective, both on the part of the researcher and the participants. Goetze and LeCompte (1984) observe case study research “is one of the few modes of scientific study that admit the subjective participation and biases of both participants and researcher into the research frame” (p.95). The researcher is the primary research instrument and, as such, the study is limited by the sensitivity and integrity of the researcher. This can be
both a strength and a weakness. In this particular study I have acknowledged my position as an employee of BCIT and role in the Bachelor of Technology initiative. I believe my overall understanding of the context and process enhanced my awareness, knowledge and sensitivity to many of the challenges, decisions and issues encountered and assisted me working with the informants in this study. In addition, I bring to this study personal knowledge of the structure of higher education in the United Kingdom and Germany, working knowledge of both the structure of higher education in British Columbia and the culture of BCIT, and intimate involvement in the process to solicit degree granting. I believe these to be strengths which could lend more profound insights and result in a richer holistic description and understanding of the research problem. Due to my previous experiences working closely on the degree initiative, I acknowledge the potential for subjective biases or conflict of interest. Although every effort was made to ensure objectivity, these biases may influence the way I view and understand the data I collect and the way I interpret experiences.

Summary

This study is a historical case study depicting the creation of Bachelor of Technology degree at BCIT as the unit of analysis for the legitimation of applied knowledge in British Columbia. This is a unique or critical case study due, in part, to BCIT being a unique institution but primarily to the “bottom up” process by which BCIT sought degree granting on an individual basis. This contrasts with other jurisdictions where the process was government driven and in most cases on a system wide basis. Data were obtained predominantly from interviews and primary sources documentation, however as the researcher had been intimately involved with the Bachelor of Technology degree initiative for six years, participant observation was also a contributing factor. Informants to the study represented past and present BCIT personnel,
government, corporate and alumni stakeholder groups. Themes and sub-themes were extracted from the data by coding techniques and the validity and reliability of the data was checked using triangulation, member checks, interview techniques, authorization of the researcher, and reflexivity strategies.
Chapter Four:
Applied Knowledge in British Columbia
— A Historical Perspective
This chapter provides a historical overview of applied knowledge at the tertiary level in British Columbia. Chapter One established a continuum of applied knowledge, spanning knowledge acquired through professional, technical/technological and vocational education. This chapter discusses the history and the contribution of the various post-secondary institutions in the province to applied knowledge. Prior to the mid 1960s, offerings in applied education were polarized, only the extremes of the applied knowledge spectrum, professional and vocational education, were available in the province. This chapter highlights a void in the provision of technical/technological education in British Columbia, a void which led to the creation of BCIT in 1964.

In 1960 aside from a forest ranger school established in 1946 British Columbia provided no opportunities for technological training other than its university and high schools (Harris, 1976, p. 494).

The University

Professional education is a responsibility of the university. The first recorded reference to a university in British Columbia was in a letter to the editor of the British Colonist of September 17 1871, signed G.

...what about the higher education of the country? Where are we to draw our supply of literary and professional men to supply the wants of this Province in the future?...Can nothing be done now to secure a University to British Columbia? (Daily British Colonist, September 17 1871, cited in Johnson, 1964, p.73).

In 1872 John Jessop, Superintendent of Education drew to government's attention:

The fact, too, that British Columbia will soon require a Provincial University, capable of conferring degrees in Arts, law and Medicine, should not be lost sight of....(Supplementary Report to Public Schools Report 1871–1872, p.44, cited in Logan, 1958, p.1).

The original attempt to establish a university in British Columbia was articulated in The Act Respecting the University of British Columbia (1890). The university was to be empowered
to grant degrees in: Arts, encompassing all branches of a liberal education; Science, notably including vocationally oriented subjects such as Agriculture, Mechanics, Mining and Civil Engineering; Medicine and Law. A Normal School was to be connected with the university to give recognition to teaching as a profession. However, regional differences, particularly over the choice of location, resulted in this plan for a university being aborted. (Logan, 1958).

The University of British Columbia opened as an independent degree granting institution in 1915, having originated in Vancouver High School, later renamed Vancouver College, and then in 1906 being incorporated as McGill University College of British Columbia. The Act to Establish and Incorporate a University for the Province of British Columbia (1908) underscores the utilitarian function of the university:

The University shall as far as and to the full extent which its resources from time to time permit, provide for:

a) Such instruction in all branches of liberal education as may enable students to become proficient in and qualify for degrees, diplomas and certificates in science, commerce, arts, literature, law, medicine and all other branches of knowledge;

b) Such instruction, especially, whether theoretical, technical, artistic or otherwise, as may be of service to persons engaged or about to be engaged in manufactures, mining, engineering, agricultural and industrial pursuits of the Province of British Columbia.

c) Facilities for the prosecution of original research in science, literature, arts, medicine, law and especially the applications of science. (Section 9)

Dr. Henry Esson Young, Provincial Secretary and Minister of Education, introducing the Bill into the house, declared that "the first thing they had borne in mind in providing for the university was the development of the mining, forestry and agricultural resources of the Province, and an education that would aid this" (cited in Logan, 1958 p.37). The university to be set up by this Act was quite obviously no "ivory tower" (Logan; 1958). The university opened with three Faculties: Arts and Science, Applied Science and Agriculture, two of which have a distinct vocational orientation.
While a university’s charter traditionally authorized degrees in law, medicine and theology, the academic legitimacy of other vocationally focused programs such as engineering, agriculture and forestry was a matter of considerable debate in established universities in the early 1900s in Canada. There was confusion about the cultural versus the utilitarian function of the university:

We find it difficult, however, to come to a clear understanding of what the University really is. The older and newer tendencies with respect to the Universities organization and work seem still in conflict. At present the university seems to us a loose federation of technical and professional schools. We are not aware that there are any general conditions, constituting a basis or reflecting a principle according to which any technical or other school may enter and form a part of the real Cultural University. Without desiring to reduce the prominence given to cultural work in the University instruction, we think it advisable of you to determine as definitely as possible the organic relation of the various federated branches to the cultural heart of the University. This would help greatly in clarifying the organization of technical instruction, and assist in co-ordinating this instruction as carried on by higher and lower schools, and of preventing overlapping. in this way, the country would know better what technical instruction to expect of our University, and in the end of each grade of school as well (Report of the Royal Commission on the University of Toronto 1906, p.167).

The report of the Royal Commission of 1906 was a largely successful attempt to define the role of a publicly supported university which included their approval of professional education. This report had a significant influence on the universities about to be established in the West. In British Columbia for example, instruction in agriculture, engineering and forestry was recognized as legitimate and important functions of the university from the outset, (Harris 1976). Engineering was elevated to Faculty status in 1921 and, although the first degree in forestry was awarded in 1923, forestry was not established as a separate Faculty until 1951. By 1960, British Columbia offered two degrees in forestry, the original B.A.Sc. in forest engineering through the Faculty of Applied Science and B.Sc.F. providing specialization in technical forestry, forest business administration and chemical and wood products, through the Faculty of Forestry.
Harris (1976) reports that by 1920 household economics, nursing, social work and commerce were on the point of gaining academic legitimacy within the university sector (p.261).

Significantly, the University of British Columbia has the distinction of being the first university in Canada to offer a degree in nursing thereby conferring formal legitimation on nursing as a profession. In 1919, the Department of Health and Nursing was established in the Faculty of Applied Science and the first B.Sc.N degree was awarded in 1923. Commerce received professional status when, after many years of advocacy, in 1929 a course leading to a Bachelor of Commerce was established. Commerce was separated from the Faculty of Arts and Science with the establishment of the Faculty of Commerce and Business Administration in 1957.

Social work was introduced in 1929 first as a two year diploma program, within the Department of Economics, Political Science and Sociology. However from 1940 onwards the diploma was only offered at the post-graduate level. Although a Department of Home Economics had been approved by the Senate, funding problems in 1920–21 resulted in delay of this initiative for more than two decades. The Bachelor of Home Economics was first offered in 1943.

Although the institutionalization of professional courses such as Law, Medicine and Pharmacy had been discussed as early as the 1930s; funding issues and the intervention of war delayed establishment of these Faculties at the University of British Columbia. However increasing demand for student places in the post-war years, coupled with the recognition that the three original Faculties were not sufficiently comprehensive to satisfy the higher education needs of the province led to the establishment of new Faculties (Logan, 1958): The Faculty of Law was established in 1945, Medicine in 1949 and Pharmacy in 1951. The
Faculty of Graduate Studies was established in 1948 reflecting the stimulating effect of the war years on research (Logan, 1958) and the Department of Forestry was elevated to Faculty status in 1951. The Department of Education, established in 1925, was granted Faculty status in 1956. Teacher training had received added professional status with the introduction of a Bachelor of Education degree in 1942. A relative late comer, the Faculty of Dentistry was established in 1964. By the time Simon Fraser University and the University of Victoria were established in the mid-1960s, professional education was well accepted as a legitimate component of university curriculum.

**Vocational Schools**

In 1940 one of the most striking features of the Canadian post-secondary scene was the few institutions devoted to technical and vocational training (Harris, 1976, p. 492).

Vocational education at the post-secondary level in British Columbia originated in 1901 as a course within a public school (Dennison 1992) and later in 1915 as a program offered in Vancouver's King George's High School (Meredith 1983). However the first self contained public vocational school in British Columbia was established in Nanaimo in 1936 as the Dominion Provincial Youth Training School to teach simple skills to unemployed youth. The school initially offered training in automechanics, building construction and business education (Quale, 1967). Subsequently in 1949, responding to the occupational needs of an expanding provincial economy, the Vancouver Vocational Institute was established, administered by the Vancouver School Board. Vocational training opportunities in British Columbia remained limited until the 1960s when a federal cost sharing initiative enacted through the Technical and Vocational Training Assistance Act (1960) enabled unprecedented expansion of provincial vocational training facilities. The British Columbia Vocational
School system was established through this federal funding scheme. New vocational schools constructed throughout the province included the British Columbia Vocational School (BCVS) Victoria, BCVS Burnaby, BCVS Kelowna, BCVS Kamloops, BCVS Nelson, BCVS Prince George, BCVS Dawson Creek, and BCVS Terrace. All were administered from the Department of Education in Victoria. These schools, together with publicly funded schools of art in Nelson and Vancouver, and hospital based nursing education provided a well dispersed array of training facilities. The curricula of the vocational schools included short term trades training, apprenticeship courses and academic upgrading. Although this training was intended for youths and young adults, the reality was that space limitations in some programs resulted in a preference for better qualified and older applicants (BCHRDP, 1992). Dennison (1992) questions the legitimacy of “post-secondary” as applied to vocational schools but rationalizes its use notably because vocational schools evolved as integral components of community colleges.

**Community Colleges**

British Columbia’s Community Colleges were established during the expansive phase of post-secondary education common to industrialized societies in the 1960s, attributed to the sometimes conflicting ideologies of human capital investment and equality of opportunity (Teichler, 1988; Moran, 1991; Brown and Lauder, 1992). The Macdonald Report (1962) is generally regarded as the prime motivating force in the establishment of a college system in British Columbia. Prior to 1962 little development or diversification of post-secondary education had occurred in British Columbia. The complete spectrum of post-secondary education consisted of the University of British Columbia with its satellite campus in
Victoria, the tiny Notre Dame University in Nelson, one small private college and the vocational schools mentioned earlier.

John B. Macdonald, President of the University of British Columbia headed a study team mandated to determine the future needs of post-secondary education in the province. Macdonald took account of the demand for increased access to post-secondary education by growing numbers of students across the province and of the demand for trained manpower in a resource based economy. The Macdonald Report (1962) was committed to excellence in education and reasoned that this could only be achieved through the creation of alternate institutions, complementing the universities, with distinctive mandates (p.50) and with autonomous governing structures (p.87–88). The report recommended the establishment of two four year degree granting colleges and six two year multipurpose colleges located throughout British Columbia, the latter would operate under the auspices of the local school boards. The government, while endorsing the concept of the two year colleges, rejected the recommendation for four year colleges but moved instead to create two new universities. Victoria College established as an affiliate of the University of British Columbia in 1920, was designated the University of Victoria and planning began for Simon Fraser University in Burnaby.

The Macdonald Report (1962) and subsequent legislation, served only as mechanisms coordinating wider public concerns. Public demand for equality of opportunity for post-secondary education throughout the province had been increasing, spearheaded in many cases by local school boards. Of greatest concern were the geographic, economic, socio-cultural and psychological barriers to accessibility of degree programs. Community colleges emerged as a result of this grass roots, “bottom up,” public demand.
The provincial government, prior to committing fiscal support for a new college, required local communities to hold both a plebiscite and referendum to elicit local tax support for capital construction. Only one of the referenda was successful. West Kootenay Regional College, an ancestor of Selkirk College, was established as a brand new college in 1964. Reluctance to commit tax dollars on the part the majority of communities lead both to an array of ad hoc locations for the beginnings of some colleges and an agreement between the federal and provincial governments to meld proposed new community colleges with the federally established regional vocational schools wherever possible. The rationale for this meld was two fold: first, existing capital facilities buildings were utilized and second, by housing academic and vocational studies under one roof, it was hoped that the perceived “status” difference would be reduced.

Between 1965 and 1975, many of the new colleges were “superimposed” on the existing British Columbia Vocational Schools or vice versa (Appendix 4). The vocational schools continued to operate but increasingly their institutional identity became assimilated with their respective community college. Four colleges were established without a pre-existing vocational school, and two colleges were designated from parent colleges (Appendix 4). Colleges were community controlled through local school boards until the enactment of the College and Institute Act in 1977. Currently there are 15 community colleges in British Columbia, five of which now have university college status.

British Columbia’s community colleges were conceived, born and nurtured through local and regional support (Dennison and Gallagher, 1986), consequently their overarching function is responsiveness to the cultural, social and economic needs of their communities. As part of the non-university sector, colleges were allocated distinctive aims and purposes. Community
colleges aimed to provide a multi purpose curriculum serving the needs of a mix of students of varying abilities and diverse educational and social backgrounds, and with differing educational goals, thus promoting goals of equality and democratization of the education system. The accent was on the student and student objectives.

The primary function of the community colleges was to provide university transfer courses, satisfying the demand for university level studies by students outside the Lower Mainland. These courses carried transfer credit towards a baccalaureate degree at a university. Technical courses were to be offered to supply local manpower needs. The Task Force Report on Technological Training in Engineering, Health Science and Related Fields (1981) states:

the comprehensive community college system was developed but did not include any technological education. However, with the pressures of advisory committees, province-wide technological shortages and local student demand the community colleges began to offer programs in technology. Initially they offered simply the first year of a program and the students transferred to BCIT to complete their training. Eventually two year programs emerged at some of the colleges (p.20).

While trades programs were present in community colleges as a result of the melding with established vocational schools, technical programs training both technicians and technologists gradually increased, causing a blurring of boundaries with BCIT. For example, technologist and technician programs formally accredited by the Applied Science Technologists and Technicians of British Columbia, were offered at Camosun, Cariboo, College of New Caledonia, Fraser Valley, Kwantlen, Malaspina, Okanagan, and Selkirk Colleges. However, according to a former Vice President, Education, BCIT, many colleges later “bailed out” of some technical and trades programs because of the high cost of delivery.

In general, community colleges offer the following range of programs: academic in the case of degrees or university transfer, a variety of career/technical options, short term trade, adult basic education providing a “second chance” to those who do not have scholastic credentials.
for post-secondary education, English as a second language for new Canadians, community education, business/industry partnership initiatives and international education. Contract training is provided to the federal and provincial governments and private industry. Programs are on both a full time basis or on a part time basis through continuing education, and include both credit and non credit courses. Variation of duration of studies ranges from weeks in the case of apprenticeship programs to four years in the case of full time degree programs in the university colleges. Community colleges are increasingly involved in technology transfer and while they have no research mandate McArthur (1993) found that both “scholarly activity” and contract applied research were occurring to varying extents in all colleges in the province. Heavy faculty workloads, combined with lack of assistant personnel and other resources, limit the scope of this research.

Beinder (1983) saw the college movement as a unique social phenomena bringing people together, creating a more tightly knit and understanding society. However “restraint” of the 1980s resulted in a shift in emphasis towards workforce preparation and the attainment of marketable skills while activities aimed at personal and individual development of students were funded less generously (Dennison and Gallagher, 1986). The function of community colleges is thus seen to be subject to changing political priorities which has resulted in a trend from community orientation towards provincial and national agendas.

**Open Learning Agency**

The Open Learning Agency (OLA) made a significant but perhaps not well recognized contribution to technical education in British Columbia. OLA was officially established on April 1 1988, through the passing of provincial legislation, Bill 58, *The Open Learning*
Agency Act. OLA was the product of a merger of two organizations, the Open Learning Institute (OLI) established in 1978 and the Knowledge Network of the West Communications (KNOW) established in 1980. The Act effectively dissolved these two organizations and created three programming components within the Agency, the Open University, the Open College and the Knowledge Network (Neilsen, 1992).

In the 1970s, a binary system of education prevailed in British Columbia. While the community colleges had improved overall access to post-secondary education in the province, access to third and fourth degree level studies for adult students living in non metropolitan areas remained problematic. Much of the province's human capital potential remained untapped. OLI, the forerunner of OLA, was established by an Order in Council on June 1 1978, under the College and Institute Act. Although the public rhetoric was couched in social justice, improved access and democratization of opportunity, Moran (1991) asserts, that the underlying reasons for OLI were economic, based on the benefits of investment in human capital: OLI was given legislative authority to offer undergraduate degrees in arts and science in its own name and to offer non-degree credentials in career, technical, vocational and adult basic education subjects. Instruction was to be given via distance education and through collaboration with other-institutions. The realization of a vision of Dr. Patrick McGeer, Minister of Education and his deputy, Dr Walter Hardwick, OLI was created over widespread opposition of senior administrators and faculty in provincial universities and colleges and in the face of indifference and misunderstanding in government (Moran 1991). The introduction of degrees by distance education had both educational and political significance. Educationally, it challenged the normative concept of education as a face-to-face activity (Moran 1991) and politically it was, as the former Director, Universities and
Provincial Institutes points out, “the first breakthrough on getting the monopoly away from the universities.”

Technical education was not offered initially. Program offerings in the first few years of OLI’s existence reflected strategies adopted as OLI sought legitimacy and identity within the provincial system. OLI was unique. First, it employed a non-traditional delivery mode. Second, it did not fit comfortably into the established system, it was neither university nor college but straddled the binary line. Initially, OLI elected to seek legitimacy and hence survival by conforming to the established system and elected to take on the norms and standards of university programs, albeit its access policy of openness rather than exclusivity, resembled that of the colleges. At the outset OLI offered only traditional university programs with an emphasis on liberality. Moran (1991) asserts that “the Institute was now too vulnerable to state demands for relevance and economic utility to allow major shifts in policy and challenge to traditional fields of knowledge” (p.194). The attack on higher education in the early 1980s, under the guise of restraint, compelled OLI to take a more utilitarian approach to curriculum.

Moran (1991) differentiates between career, vocational and technical education in discussing OLI’s role in employment orientated education. OLI opted to focus initially on career and vocational fields for two reasons. First, BCIT, envisaged as “large, well established and powerful” and sitting at the “top of the college/institute hierarchy in British Columbia,” (Moran 1991, p.104), was already offering distance education courses and planning to expand in this area. OLI rationalized that, keeping out of the technical field, would encourage mutual agreement as to the appropriate jurisdictions for each institution. These concerns were well founded:
Chapter Four: Applied Knowledge in British Columbia — A Historical Perspective

The major point I think we should make in Continuing Education is that we become the Open Technical University... the way of the future is not an institution with walls but an institution that gets out to the learner and is learner centred... I think we should go for broke on this one and indicate that we are already bigger than OLI.3

Second, technical subjects required 'hands-on' training which many people thought could not be provided by distance methods.

OLI programs were one year full time equivalent certificate and two year diploma programs and served both initial entrants to the work force and those requiring upgrading. The majority programs in the career, vocational and technical area fell under the somewhat loose heading of 'business studies'. Moran (1991) states, "OLI ventured rarely into the technical area on its own" (p. 104). Increasingly in the 1980s OLI became involved in more technical and trades training programs but usually as collaborative partner. For example, OLI and the Pacific Vocational Institute developed respectively the theoretical and 'hands on' components of the electrical generating systems program.

The focus of this study is the recognition of technological education to the baccalaureate level in British Columbia. OLA played a pivotal role in this endeavour as a result of partnership arrangements with BCIT and the colleges. A detailed account of OLA's relationship with BCIT, outlined below, emphasizes the significance of OLA's role both as a supplier of technological education and in laying a foundation for BCIT's own degrees.

By the late 1970s demand existed in British Columbia for post diploma training in some technological areas. In response and encouraged by McGeer, debate ensued about the possible evolution of BCIT into a polytechnic institution with authority to grant technology degrees in areas where there was an identified market need. Why this initiative failed is not totally clear, however, it can be attributed partly to the findings of two concurrent ministerial
A more detailed account is given in Chapter Six. The government rejected the concept of a baccalaureate in technology but endorsed the need for advanced technological training beyond the diploma level. Responding to post diploma needs, BCIT introduced an advanced studies program culminating in an Advanced Diploma credential, recognizing however, that for many graduates a degree was the necessary credential for career advancement and that attempts must be made to articulate these advanced studies programs into university degree programs. Articulation into a degree program was deemed essential for BCIT's first Advanced Diploma candidates, nurses. As more nurses with degrees entered the system, recent baccalaureate graduates were "screened" into opportunities for promotion and advancement at the expense of more experienced nurses with service based training.

Opportunities for articulation were discussed first with University of British Columbia and then the University of Victoria. Although the quality, depth and scope of BCIT's courses received a very favourable report from a University of British Columbia examining committee who, according to a former Associate Dean of Nursing, "deemed them basically probably better than the baccalaureate courses they were offering in those subject areas," articulation at both universities was denied due primarily to philosophical differences rather than content or quality of courses. Simon Fraser University and BCIT had enjoyed very positive partnering relationships but the lack of health sciences programs meant there was not a suitable home for the nursing program.

The Open University was then approached by BCIT's School of Health Sciences as a possible route to a nursing degree. The suggested model was one of degree completion built on the two year diploma. The advanced technical studies would be provided by BCIT and the
liberal studies would be provided by OLA. The degree conferred would be a joint BCIT/OLA degree. At that time OLA was receiving similar degree completion requests from a variety of other health people in colleges and professional associations where, in the opinion of a former Associate Dean of Nursing, "the degree was increasingly seen as not an option but a requirement in the profession." Debate between the Open University's Academic Council, primarily made up of representatives from the existing universities, and BCIT was exhaustive and difficult. The Associate Dean of Nursing, involved in these discussions, explained that "the hitch in the beginning was that the academic institutions wouldn't countenance not only this degree but any degree that was mainly by distance education." Moreover the technology degree was different. The emphasis was on applied knowledge, the proposed model tended to go from specialization to generalization, and it was shaped to meet the needs of industry rather than being driven by academic bias. Difficulties arose primarily from the cultural differences between the two institutions. One example of this is benchmarks of baccalaureate level education. The Open University, adopting the traditional university yardstick, used input indicators such as duration of studies, library facilities and academic qualifications of faculty whereas BCIT, using an outcomes based approach, looked at student learning outcomes, their educational integrity and industry relevance. The legitimacy of the degree proposed by OLA and BCIT was resolved and endorsed by seeking external consultation.

In 1989 OLA conducted a study to examine the feasibility of BCIT and the Open University developing and delivering a high quality, distance education Baccalaureate of Health Science degree completion program, an umbrella degree which would serve all health specialties. The Bachelor of Health Science degree was introduced in 1991, first in Nursing, followed in 1992 with a specialty in Medical Imaging. Joint BCIT/OLA degrees followed in other areas:
Bachelor of Technology in Computer Systems was implemented in 1991 and a Bachelor of Technology in Technology Management began in 1992.

Additionally, OLA offered applied degrees in partnership with colleges and other institutes within the post-secondary system. Following the legitimation of university college degrees in 1995, some degrees have now been patriated to the respective colleges, specifically Bachelor of Fine Arts and Bachelor of Design to the Emily Carr Institute, Bachelor of Interior Design to Kwantlen University College, Bachelor of Business Administration, Bachelor of Arts (Criminal Justice) and Bachelor of Computer Information Systems to the University College of the Fraser Valley, and Bachelor of Natural Resources to the University College of the Cariboo. Currently OLA retains collaborative partnerships for applied degrees with Capilano and Douglas Colleges, BCIT, University College of the Fraser Valley, Vancouver Academy of Music, the College of Physiotherapists of British Columbia, and is a partner in a consortium for a Bachelor of Tourism Management.

University Colleges

In the late 1980s, the demand for undergraduate degree places in British Columbia far exceeded the supply. British Columbia ranked ninth among provinces with respect to degrees awarded per 1000 adult population and seventh in full time post-secondary enrollment of the eighteen to twenty four year old cohort (MAEJT, 1988, p.4). While community colleges provided opportunities to students to begin academic programs, “degree attainment had not been a hallmark of the B.C. system” (Dennison, 1992, p.111). Of particular concern was inequality of access to university degree programs for people living outside either the Lower Mainland or South Vancouver Island. Specifically, there was a demand for upper level
courses leading to baccalaureate degrees. The government initiative “Access for All” announced March 1989 resulted from recommendations of a Provincial Access Committee, established the previous year by the Honorable Stanley B. Hagen, Minister of Advanced Education and Job Training with a mandate to investigate accessibility to advanced education and job training for all British Columbians. As the Deputy Minister at the time recalls, “I was brought in by the government with a specific mandate to strengthen and expand the post-secondary system in British Columbia.”

A clear objective of the Access initiative was to get the British Columbia participation rates to the national average. In the late 1980s, a high student demand for academic programs existed and significant numbers of qualified students were increasingly being turned away from post-secondary institutions for lack of places. Recommendations of the Provincial Access Committee (1988) included expansion of first and second year academic programs and the creation of a new university in northern British Columbia, but most interestingly the Report suggested:

that in more densely populated college regions outside the Lower Mainland and south Vancouver Island (for example, Okanagan and Cariboo College regions), university degree programs be expanded by means of the establishment of an upper level “university college” component, (p.16).

Access for All (1989) initially designated Okanagan, Cariboo and Malaspina community colleges as university colleges. Fraser Valley community college was added later. Their initial operation was envisaged as follows:

(The university college)...would be an organizational entity within each college, providing arrangements for upper level university courses involving one or more of the three public universities and the Open Learning Agency...Degrees would be granted by the university responsible for most of the instruction, or by the Open learning Agency (MAEJT, 1988, p.17).

The university college partnerships combined aspects of both the university and the college by adding third and fourth year university degree programs to the comprehensive educational services traditionally offered at community colleges. Colleges provided the facilities and
administrative support, while the universities determined admission and graduation requirements, and granted the degrees. Program and faculty selection was done jointly. The first degrees were awarded at Okanagan, Cariboo and Malaspina university colleges in May 1991, whereas third and fourth year degree completion courses were first offered at the University College of the Fraser Valley in September 1992. In January 1995, the umbilical cord was cut: Bill 22, Amendment to the College and Institute Act legislated the university colleges as autonomous degree granting institutions. The legislation included Kwantlen College as a university college.

University colleges are presently determining their unique cultural identity within the post-secondary system. The contribution they will make to technical education is not yet clearly defined. As community colleges they offered and continue to offer one and two year certificate and diploma programs in technical education. This role was not expanded significantly during their partnership phase with the universities, where the degrees offered were necessarily restricted to those traditionally offered by the universities. Professional degree programs in Nursing, Education, Business and Social Work were offered (Dennison, 1992) but the majority of degrees were in discipline-based Arts and Science subjects. As autonomous degree granting institutions, the university colleges now have the flexibility to introduce degrees in non-traditional areas. To date, in addition to the applied degrees patriated from OLA, Malaspina University College has implemented a degree in Fisheries and Aquaculture. Kwantlen University College intends to offer only applied degrees.

"Access for All" (1989) had a strong focus on a major expansion of the academic component of the post-secondary system. Although never specifically stated, the assumption was that a plan, "Access-Part Two," would address all the applied programs. According to an Assistant
Deputy Minister recalls, "there was always the other half that we were assuming would come along. It never did."\textsuperscript{10} "Access for All" provided a context in which a number of things in the 1990s occurred, because as the Assistant Deputy Minister contends, "there was a strong feeling that while it did good things, it distorted the system because it addressed in a large part only the academic component of our system."\textsuperscript{11} This perceived distortion in British Columbia's post-secondary education system provided the context for some of the initiatives of the 1990s including the Premier's Summit on Skills and Training (1993), and the consequent Skills Now (1994) initiative which was a step to address the imbalance in the system. BCIT's Bachelor of Technology degree was introduced as a strategy within Skills Now. Therefore, even though a parallel multi-year Access plan for applied programs did not materialize, there were important program and policy decisions that were intended to re-establish balance in our post-secondary system.\textsuperscript{12} Subsequent policy documents, for example \textit{Learning and Work: The Way Ahead for British Columbians}, (1991); \textit{the Human Resource Development Project Report}, (1992); \textit{Training for What?}, (1995); \textit{Charting a New Course} (1996); and \textit{Intermediate Skill Development in British Columbia: New Policy and Research Directions}, (1997), all delineate the need for increased emphasis on the utilitarian function of post-secondary education.
Summary

This chapter detailed the evolution and the contributions to applied knowledge of the different types of institutions constituting British Columbia's post-secondary system, specifically universities, vocational schools, community colleges, university colleges and OLA. The historical overview revealed a progressive increase by the universities in their offerings of applied knowledge responding to demands of advancing professionalism, however prior to the 1960s, a bifurcated system remained in the province. Theoretically focused professional education was offered by the universities and hands-on vocational training was provided by the vocational schools. British Columbia did not offer opportunities for technical/technological education. Community colleges offered some applied programs to meet their regional needs but focused primarily on university transfer programs. The contribution that university colleges will make to applied knowledge is yet undetermined. As a result of former partnerships with the universities, their initial degree programs have been largely discipline-based.

The contribution of OLA to applied education in British Columbia is significant. Jurisdictions such as United Kingdom, Germany and Australia, moved towards a mass education system in the 1960s in part by creating a binary system emphasizing technological education to the baccalaureate status, while British Columbia diversified through the creation of community colleges, retained a unitary system and consequently did not offer an alternate degree route for technological education. The Open University provided the first path to baccalaureate degrees in technology programs. The dearth of technological education for British Columbians in the 1960s resulted in the creation of the British Columbia Institute of Technology in 1964. A social history of BCIT is the focus of Chapter Five.

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Footnotes

1 Submission of the Technical Education Committee of the Canadian Manufacturers’ Association to the Royal Commission on the University of Toronto.
2 Former Director, Universities and Provincial Institutes: Interview, August 29, 1997.
3 President of BCIT to Vice President, Education: Memo, July 8, 1980.
4 Former President of BCIT: Interview, October 1, 1996.
5 Former Associate Dean of Nursing: Interview, July 25, 1996.
6 Ibid.
7 Ibid.
8 Ibid.
9 Former Deputy Minister: Interview, August 12, 1996.
10 Assistant Deputy Minister: Interview, August 30, 1996.
11 Ibid.
12 Ibid.
Chapter Five:
The British Columbia Institute of Technology
The introduction of a major new initiative within an organisation must take account of the mission and mandate of that organisation, its consequent organisational structure and pertinent history. Tosh (1991) reminds us that “we cannot understand a situation in life without some perception of where it fits into a continuing process or whether it happened before” (p.1). This chapter presents the mission and mandate of BCIT and traces the social history of the institute from its origins in the early 1960s to its designation as a degree granting institution in 1995. A changing mandate and shift in institutional focus over three decades, provides a context for the development of the Bachelor of Technology Degree, to be discussed in Chapter Six. The chapter focuses in part on areas of expertise developed within BCIT which were to play an enabling role in degree granting status for BCIT, specifically the Extension Division, Distance Education and the Technology Centre.

Overview

The British Columbia Institute of Technology (BCIT) was founded in 1964 by the government of British Columbia. Currently BCIT is the fourth largest post-secondary educational institution in British Columbia, with approximately 40,000 students registered on a full and part time basis within six different schools. BCIT is a multi-campus facility with the main campus in Burnaby and smaller campuses located in Vancouver, Surrey, Burnaby, Richmond, North Vancouver, Langley and Maple Ridge. BCIT is mandated to deliver science and technology-based technology and trades programs, with an applied rather than academic emphasis, designed to meet the needs of the workplace. BCIT provides “job ready” graduates to enhance the competitive position of British Columbia’s business and industry sectors.

Our mission is to provide British Columbians with world-class, job ready skills for career success. (BCIT mission statement, approved by the Board of Governors October 26 1993).
BCIT’s current mandate, approved by the Board of Governors, March 15, 1994 and the Ministry of Skills, Training and Labour states:

BCIT will be a province-wide, innovative organisation, specialising in advanced technology training and focusing on those initiatives that increase the level of economic activity, entrepreneurial activity, and employment in the province.

BCIT will:

- prepare dynamic, highly skilled members of the workforce by delivering full and part-time courses of study including:
  - certificate, diploma and degree studies in technologies and trades,
  - contracted industry training and upgrading courses.
- conduct technology transfer activities by providing opportunities for innovation, industrial assistance and contracted applied research.

The Beginnings

For many years the only institutions offering post-secondary education in British Columbia were the vocational schools and universities. The work of a technician or technologist was performed usually by engineers or science graduates. Both industry and graduates indicated that their training was inappropriate for their work.

A great demand is now being made on the university graduate to do the work of a technician. This is not always the best man to do the job (Bridge, 1960, Summary of Opinions p.2).¹

BCIT was created in 1964, in part to fill a gap in the education system and to address the need for highly skilled technology graduates. The origin of BCIT is attributed to both federal and provincial initiatives. In the late 1950s, the need for technological training was identified by both federal and provincial governments as essential to Canada’s economic growth. Despite high unemployment in the recession of 1957–1961, skilled tradespeople and highly trained technologists were being imported into Canada in large numbers. The Canadian
labour force lacked adequate training for these roles. Specifically, in British Columbia, advancing scientific knowledge brought more sophisticated technology to both newly established and existing industries. This new technology required complex job roles beyond the vocational schools’ capacities and theoretical knowledge beyond that acquired by the average tradesperson (Bridge 1960).

**Provincial Role**

At the provincial level, the origin of BCIT can be traced to two concurrent but independent investigations, the Chant Commission (1960) and the Bridge/White Survey (1960). The plans for BCIT were underway at the time of the Macdonald Report (1962) on higher education in British Columbia, however the report supported the concept of an institute of technology.

On January 17, 1958 responding to growing public concern about public education, the Minister of Education for British Columbia, the Honourable L. R. Peterson announced the appointment of a Royal Commission on Education. The Commission, headed by Dr. Sperrin N. F. Chant, Dean of Arts and Science at the University of British Columbia, (referred to as the Chant Commission) was charged “to inquire into, assess, and report upon the provincial educational system to university level” (Chant, 1960, p.1). Concurrent with the Chant Commission, the Department of Education undertook an independent survey of The Need for Advanced Technical and Vocational Training in the Province of British Columbia, (Bridge/White survey). While the focus of the Chant Commission was on elementary and secondary schooling, the Bridge/White survey pertained to post-secondary education. The Bridge Report (1960), Need for Advanced Technical and Vocational Training in the Province of British Columbia, was submitted to the Royal Commission in April 1960 for consideration. BCIT was conceptualised within the Bridge/White survey.
The Bridge/White Survey

As early as 1957, the Provincial Consultative Committee on Technical and Vocational Education had recommended that the Department of Education ascertain the need and type of advanced technical training which would best meet provincial requirements. Further impetus came the following year when the Provincial Curriculum Advisory Board, chaired by Dr. J.F.K. English, Deputy Minister of Education, recommended that the Department of Education take advantage of a federal offer of assistance in conducting a survey in the advanced technological and vocational training fields (Bridge 1960). The study received formal authorization in the Speech from the Throne of January 1959 by the Minister of Education, the Honourable L.F. Peterson.

The survey was undertaken by Mr. John S. White, Director, Technical and Vocational Education for the province and Mr. David E. Bridge, a Technical Specialist with the Canadian Vocational Training Branch in Ottawa. White (1969) states:

the commencement of the British Columbia Institute of Technology actually began when Mr.J.S.White obtained the services of Mr D.E. Bridge ...to assist him in making a survey re technological needs in the Province of British Columbia (p.2).

The purpose and terms of reference of the survey were:

to determine the kinds and the numbers of technicians required in British Columbia to meet the present and the future skilled manpower needs of the province. Further, the survey was planned to ascertain the geographical areas in which the need existed, the nature of the need, the program required to meet the need and whether the need was temporary or permanent (Bridge, 1960, p.1).

Interviews were undertaken with industry, business, commercial firms, educational bodies, university officials and government officials. Early in the process, Bridge (1960) identified a lack of understanding in industry of the terms technician and technical education and recalled
that, “at the beginning of each interview it was necessary to establish clearly the meaning of the term ‘technician’ and the function which may be performed by a technician” (p.5) because:

Industry, in general, was not familiar with the product of an Institute of Technology of recognised standing. Accordingly, it was inclined to think of the technician as one who had upgraded himself by many years of experience with perhaps some self study (p.8).

John White recalls that, whilst most industry leaders were interested in the idea of British Columbia training its own technicians for industry:

we did find an almost unusual ignorance about what was involved in technician training and what would be the duties of technicians who would be employed in industry. We found it necessary to explain many times the differences in training required for university trained personnel, technicians, and tradesmen. We found in the course of our interviews that most industries were employing professional trained persons to do technicians’ work, i.e. university graduates from the Engineering, Business and Medical faculties.2

Current terminology employs a hierarchial distinction in the role of a technician and technologist, the Bridge Report uses these terms interchangeably.

The Bridge/White survey identifies three major areas where agreement was almost unanimous pertaining to the creation and function of BCIT. First was the acknowledgement of the need for a new type of institution providing advanced technical training. Bridge (1960) reported:

almost without exception every firm interviewed was keen to see the establishment in B.C. of a post-secondary type of education in the nature of an Institute of Technology (p.20).

The response of the university sector was diverse. While the majority of university officials supported technician training and agreed it should be done outside the university, concern was expressed by Professor Muir, Faculty of Applied Science, University of British Columbia; “lest the establishment of an Institute of Technology drain off revenue for the
operation of the university” (Bridge, 1960, p.23). More direct opposition came from Dean Eagles and Dr. Jack Campbell, Department of Agriculture, University of British Columbia, who both urged:

that in many instances there was not room for both a graduate and a technician and since a technician would be of little value without a graduate to supervise him, there would seem to be little need for training technicians (Bridge, 1960, p.9).

Interestingly, this statement and attitude are quite the reverse to those expressed by representatives from the Federal Research Laboratory and the Department of Agriculture, Victoria, B.C. (Bridge, 1960, p.9), all of whom indicated a substantial need for technicians in the various branches of agriculture. This may imply territorial concerns on the part of the university. Second, was the agreement that existed on the need for both day courses and extension courses. The report indicated a desire on the part of industry to provide, in addition to day courses for students coming from high school, extension courses for those presently in the work force, both to enable career mobility and to adapt to changing technology. Third, was the consensus that a nationally recognised credential be awarded. Industry stressed repeatedly that both day and extension courses should have similar content and be at a nationally recognised attainment level:

If the employee’s scholastic work is at a national level his certificate will be negotiable anywhere in Canada and we hope recognised in other countries.....any courses should be of such a level that would carry transferrable credits towards standing as a professional engineer or towards credits of a degree at the university (Bridge, 1960, p.4).³

The Bridge Report (1960) gave specific direction as to the areas of technological training needed in British Columbia and recommended:

that technological training be introduced for engineering and scientific technicians in the mechanical, electronic, electrical, chemical, instrumentation, and metallurgical fields.

that advanced post-secondary training and education be given in business, administration, accounting, and merchandising [sic].
that advanced training in medical laboratory, x-ray and radiological fields be offered with the existing programs in operation at the Vancouver General Hospital.

that training at the secondary school level for those students who anticipate advanced technical work include such subjects as English, Mathematics, and Science, to ensure that graduating students are prepared for entrance into an institute of technology and be reasonably assured of success therein (p.39).

Acknowledging that the conclusions of the Bridge Report (1960) corresponded closely to its own findings regarding the establishment of institutes of advanced technology, the Report of the Royal Commission on Education (1960) recommended:

that Institutes of Advanced Technology be established in accordance with the findings and recommendations of the survey on the Need for Advanced Technical and Vocational Training in the Province of British Columbia (p.281).

The Royal Commission used the term “advanced” in its recommendation. It is unclear what the Commission inferred by this term. Conventionally, “advanced” technology programs refer to studies beyond the two year diploma level. For example, the Park Report (1987) envisaged an advanced technology institution as both providing advanced studies for graduates of two year diploma and university programs, and engaging in applied research. BCIT did not get an “advanced” technology mandate until 1988.

Reflecting on the significance of the Bridge/White survey in the establishment of BCIT, John White was:

convinced that it was a necessary step in the planning of BCIT. The survey showed that the need existed in BC. It helped to sell the idea to heads of industry and it paved the way for the decision of government to go ahead with the plan.  

Macdonald Report

BCIT was not dealt with specifically in the Macdonald Report (1962) as the programs and goals of the institution were still in the formative stage (Macdonald, 1962, p.45). However, referring to the diversity of programs needed to meet the demands of higher education with
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respect to technological education in British Columbia, Macdonald identified the following needs: one or two years study of purely technical training beyond grade XII or a combination of technical and academic; technological and semi-professional courses for students who want formal education beyond high school, but who do not plan to complete requirements for a degree; and, adult education including re-education to meet the changing demands of technical and semi-professional occupations (p.51). These findings were consistent with those of the Bridge/White survey and supported the concept of an institute of technology.

Federal Role

The British North America Act (1867), Section 93, established education at all levels as the exclusive jurisdiction of provincial governments and the Constitution Act (1982) did not alter this division of responsibility. However, federal involvement in vocational education was justified on the basis of the need of an industrial nation for an adequate supply of skilled workers, the provision of equality of educational opportunity and, the high cost to local and provincial authorities of providing adequate training programs and facilities (Glendenning 1964, p.13).

In 1958, the Conservative government took office under John Diefenbaker during a deep recession. Importation of skilled technical labour underscored the inadequacy of the current training of Canada's labour force. In an attempt to address these deficiencies the Diefenbaker government enacted the Technical and Vocational Training-Assistance Act (1960). The Act grouped together all federal provincial activities in the field of vocational education and proposed the expenditure of more than one billion dollars, providing 375,000 student places in new post-secondary institutes and vocational schools. Specifically, the Act states that:
The Minister may, with the approval of the Governor in Council, enter into an agreement with any province for a period of not exceeding six years to provide for the payment by Canada to the province of contributions in respect of the capital expenditure incurred by the provinces on training facilities (Section 4(1)).

Under the terms of the agreement, the Federal government contributed 75 percent of the capital costs and 50 percent of the operating costs of a new facility. Dr. C. Ross Ford, Director of the Technical and Vocational Training Branch, Federal Department of Labour, was responsible for liaising with individual provinces and administering the Act.

**Getting Started**

In 1961, given the promise of federal funding and the recommendation of the Chant Commission, the provincial government instructed the Technical Branch of the Department of Education to plan an institute of technology for British Columbia. The planning process involved the appointment of two types of advisory bodies. First, an Advisory Council was founded whose primary function was to give guidance and direction to the Department of Education in the planning and the operation of the institution. Second, following the recommendations of the Bridge Report (1960), Advisory Committees were appointed for each of the seventeen proposed technology programs. The committees provided input on industry needs, curriculum content, and faculty and equipment selection, and consisted of prominent and respected people from the various industry sectors, representation from the University of British Columbia and professional associations (White 1969). Mr E.C. (Cec) Roper was appointed first principal of BCIT and took office in 1962. Mr Roper's background combined professional experience as a mining engineer, managerial skills and teaching experience from the Commerce Faculty at the University of British Columbia.
BCIT Opens

BCIT admitted its first students in the Spring of 1964 with a class of medical laboratory students. General enrolment across all technology programs began in September 1964, when 647 students were registered in seventeen technology programs in Engineering, Business and Health. The technology programs corresponded to the needs of British Columbia's industry as determined by the Bridge/White survey. The School of Engineering offered programs in Building, Chemical and Metallurgical, Civil and Structural, Electrical and Electronics, Food Processing, Forest Products, Forestry Technology, Instrumentation and Control, Mechanical, Mining, Gas and Oil and Surveying. The School of Business offered programs in Broadcast Communications, Business Management, and Hotel, Motel and Restaurant Management and the School of Health offered Medical Laboratory and Medical Radiography programs. Initially, classes were held during the day on a full time basis.

BCIT was officially opened on October 5, 1964 by the Premier of the Province, W.A.C. Bennett. Response from the public and industry during the construction of BCIT had been far beyond the government's expectations (BCIT, 1984) to the extent that, during the opening ceremonies, the Premier announced the size of the institute would be doubled by 1967. A new classroom and laboratory wing was to be built. The Institute mandate at that time was stated by Leslie Peterson, the Minister of Education:

The aim of the British Columbia Institute of Technology will be to fit the latent skills and technical capabilities of our young people to the present and future technological needs of our growing province and indeed our nation (BCIT, 1964).

This mandate translated into a rigorous two year program requiring about 2,400 hours of instruction and leading to a National Diploma of Technology for BCIT graduates.
The First Decade: Expansion and Diversification

During BCIT's first three years of existence the focus was on establishing efficient operational procedures for the institute along with planning for the 1967 expansion. The intent was both to increase enrolment in existing technology programs and introduce new training programs. Recommendations for new programs came from industry, the Department of Education and from the Advisory Committees of the established technology programs. Recommendations were subsequently implemented on the basis of economic need, potential student market, employment opportunities, and ability of BCIT to accommodate the program within the proposed extension.

Daytime Program Expansion

In the Business and Health Divisions, new technology programs were added, the former going from three to seven with the addition of Financial Management, Computer Programming and Systems, Marketing and Technical Management, while the latter went from two to seven adding Biomedical Electronics, Health Data Processing, Medical Isotopes, Nursing and Public Health. In the Engineering Division expansion occurred as new options in existing technology programs. Enrolment increased from 647 to 2545 students between the years 1964 and 1968.5

Mr. E. C. Roper resigned as Principal of BCIT in 1967 and was succeeded by Mr. Dean Goard. Dean Goard had a strong background in technical education having taught in the Vancouver Technical School, being the first Principal of the Vancouver Vocational Institute and Assistant Director of Vancouver City College. The years from 1967 were marked by spectacular growth in student numbers reflecting a general trend of increasing student
enrolment in post-secondary education during this period. However, Carey (1975) attributes this growth, in part, to the success and advocacy of BCIT’s former graduating classes and to their reception by business and industry leaders. New technology programs and options were added to meet provincial economic needs. In 1968, in line with the vision of the Macdonald Report of a “systems” approach to higher education in British Columbia, Dean Goard, proposed a transfer opportunity to BCIT for students enrolled in the newly established community colleges. Students would take first year technical courses at their local college and complete second year at BCIT. Arguments for this initiative included the financial benefits to both student and system, and enabled colleges to develop more comprehensive educational plans for their students. The plan was first realised in September 1973 when 286 students were admitted to second year studies.

**The Extension Division**

Daytime diploma programs satisfy only a fraction of the provincial technical training requirements. Social justice, economic needs and political expediency were arguments for making technological education available to persons unable to attend BCIT because of workforce commitments or geographic location. Defining the functions of an institute of technology, the Chant Report (1960)-underscored the economic demand:

> the greater emphasis on the part of industry was the urgent need for planned upgrading courses at a national level with nationally recognised certificates (p.279).

Industry had articulated a distinct need for employee upgrading opportunities through part time extension courses. Responding to this need BCIT began planning for extension programs shortly after opening. The first official mention of the Extension Division appears in the Principal’s Report to the Advisory Council, February 10, 1965:
In December, Mr. J. Verner undertook to visit the major technical institutes in Eastern Canada to develop a pool of information on the type of advanced technical classes being offered there, and to learn as much as possible about the design and administration of such programs. Subsequently, Walter Orr has worked with Mr. Verner to outline the action required at this time. Chief among their recommendations is the appointment of Vice-Principal of Evening Classes by April 1, 1965, and some staff to assist him (p.11).

In June 1965 Mr. A. J. Elston, a professional engineer and former head of Civil and Structural Technology at BCIT, was appointed Vice President, Evening Classes. Elston (1966) articulates his philosophy and understanding of the significance of adult education in technological subjects:

Institutes of technology must in future accept the role of the central agency for development of applications of technology, just as universities already accept the role of the agency for creative development of new technology. This role cannot be fulfilled simply by producing graduates. Institutes must become an integral part of the industry and society which they serve.

The area of adult education, or continuing education, is where the institutes must develop in the future....without exception, these people need, and in most cases are aware of their need, for further technical training in engineering. Institutes must seek out these people and make provision for training them. This training must lead to certification of a worthwhile kind, if necessary to a Diploma of Technology in every way equivalent to that gained by full-time study (p.56).

The Extension Division of BCIT opened on October 4, 1965 with an initial enrolment of 350 students. In its first year of operation enrolment in night school courses increased from 352 to 1517 an astounding 430 per cent compared with an 17 percent increase in day enrolments from 1043 to 1218, indicating the significant role part time programs would play in career upgrading. The findings of the Bridge/White survey had emphasised the importance of assigning credit for part time studies. According to Thom (1986) the question of credit was important to the Extension Division from its inception (p.9), however “this was a major fight in the beginning ... department heads and faculty thought there was discipline in having to be there 35 hours per week ... how could they (students) fail when picking up one course at a
time?...well maybe we could give them a certificate." The debate on the pros and cons of allowing credit for extension division programs resulted in the following statement:

The Executive Committee has decided that credits will be given for the night school courses, although this does not preclude courses being offered which do not parallel day time courses, and for which no credit will be given.

Students in the workforce were able to upgrade and work towards a National Diploma of Technology on a part time basis. Initially, the allocation of credit for continuing education courses proved to be a differentiating factor between BCIT and the community colleges and universities.

Elston resigned as Vice Principal (Evening Classes) in June 1966, and Mr. Gordon Thom was appointed to the position. Thom (1968) described the function of the Extension Division in the following way:

...to determine and, if necessary, attach priorities to advanced technical training needs for adults in industry and then to design programs and courses to meet their needs in the most efficient manner to them as adult learners, so they can quickly and efficiently obtain needed skills and knowledge and at the same time integrate new knowledge with their respective backgrounds (p. 108).

During the period 1967–69 the Division focused on organization, strategic planning and the development of academic policy. By 1969 the role of the Extension Division was beginning to diversify. The division began to focus on providing specialized training for specific industries, firms or organizations. The identification, assembly and administration of educational resources capable of serving this need became the responsibility of a group known as Industry Services. Activity was stimulated by Canada Manpower, who encouraged industry to seek training and in some cases underwrote such training. However, rapid development of Industry Services was impeded by financing problems. The issue was resolved by government authorising the establishment of the Division of Industry Services as a separate branch of the Extension Division in 1971, and allowing it to grow on a cost
recovery basis. Industry Services played a leadership role in BCIT's history by introducing flexible delivery methods such as correspondence courses and “travelling instructors” in the provision of technical education.

Governance changes in 1974, discussed later in this chapter, establishing BCIT as an autonomous body resulted in organizational changes throughout the institution. The Extension Division was divided along lines of activity into new divisions: Career Programs; Health Continuing Education; and, Industry Services. In addition a new unit, the Directed Study Centre, was established to focus distance education needs. Although these operations shared a common purpose of making technical education available to those unable to attend daytime diploma classes, they evolved as distinct operational units largely because they catered to different clientele and adopted different strategies in the delivery of their services.

*BCIT: Annual Report, (1974/75)*, outlines the philosophy and responsibility of the Career Programs Division, as vehicle for maintaining a technologically competent workforce:

> New courses are added to keep pace with student needs and technological change. These are not dramatic, but a process of constant realignment and improvement....We believe the era of life long learning is upon us. Our plans for the next five years recognize the changing times in continuing education and reflect our concern for constant renewal and updating of our course content (p.55).

Enrolment growth throughout the 1970s underscored the increasing need for educational advancement opportunities on a part time basis. Alternative delivery methods were piloted. For example, noon hour sessions in downtown locations, weekend and week long seminars, and courses running two nights per week for six weeks were developed rather than one night per week for twelve weeks. Systems were developed to enable career/technical students to enter regular day programs on a part time basis. Responding to rapidly changing technology,
some upgrading courses in new technology for previous BCIT graduates were initiated in 1976/77.

Organisational re-structuring in 1977 resulted in the integration of Career Programs, Industry Services, Health Continuing Education and the Directed Study Centre into one administrative unit, the Division of Continuing Education and Industry Services. In the mid-eighties' the Division of Continuing Education and Industry Services was eliminated and the functions were integrated into the individual Schools. In 1985, Continuing Education was renamed Part Time Studies, to put emphasise on the credit attached to these courses and to underscore the parallelism and transferability between part time and full time studies.

**Distance Education**

Distance learners become involved in technological education for various reasons, such as coping with technological change, requirements of professional certification, response to some legislative action and threatened unemployment. Diverse reasons, coupled with circumstances of individual learners, require diversity and adaptability in delivery modes. BCIT's multi-faceted distance education methods have included correspondence courses combined with some face to face instruction, tele-tutoring, regionally based tutors, mobile laboratories, satellite equipment systems and more recently, the Internet.

Distance education was established as an institutional initiative at BCIT some years prior to being designated a provincial priority in the mid-1970s by McGeer, Minister of Education. As a provincial institution, BCIT had a responsibility for technological education throughout the province which included delivery of learning programs to those, who as a result of social, work related or geographical isolation, could not attend campus based classes. Distance
education at BCIT began in 1969 within Industry Services largely to provide short term training courses initially using “travelling instructors” and later correspondence courses, developed in cooperation with the industry client. Industry Services provided specialised training programs. However, requests from both individuals and organisations such as the Society of Engineering Technologists, indicated that a substantial number of adults constrained geographically from attending BCIT wished to pursue a diploma program rather than special-purpose courses provided via joint BCIT/employer projects. Responding to this need, in 1974 BCIT established the Directed Study Centre to design, develop and disseminate independent learning materials for adults wishing to pursue a diploma without attending campus based classes. Initially the Centre administered directed study courses developed and used by Industry Services, but later developed a course design and editing capability employing faculty on a part time contractual basis to author instructional materials. Over the next few years the Directed Study Centre emerged as a provincial focus for innovation in distance delivery of technological education (BCIT, 1978).

At the provincial level, one of the first acts of the newly appointed Minister of Education, McGeer, was to establish committees to investigate means of increasing access to post-secondary education to rural areas of the province. The findings of these committees added impetus to BCIT’s role in Distance Education. First, the Commission on University Programs in Non-Metropolitan Areas (1976), referred to as the Winegard Commission after Commissioner Dr. William C. Winegard, re-iterated BCIT’s position as “the flagship of the technical education system” (Winegard, 1976, p.21) and encouraged expansion of BCIT’s distance education initiatives. The Committee recommended:

..that the British Columbia Institute of Technology provide their specialised technical courses in outreach modular form and/or intermurally at the request of the community colleges (Recommendation 14, p.28).
that the British Columbia Institute of Technology assume the coordinating role for the development of directed studies courses in the technical area in conjunction with the colleges (Recommendation 15, p.28).

Second, the Distance Education Planning Group, chaired by Ms. Patricia Carney, charged to investigate a delivery system for distance education in British Columbia, determined that while “job related goals are by far the stated primary goals of students in the British Columbia college system” (Carney, 1977, p.59), “the need to develop distance education materials in the career/technical area was given low priority by most colleges” (Carney, 1977, p.62). Colleges, however, expressed interest in utilizing the resources of BCIT and having programs delivered to their site by distance education methods. Adults requiring upgrading were deemed the most likely candidates for distance delivery, however, lack of availability of appropriate equipment presented difficulties for skills upgrading by less specialised institutions. Additionally, the Planning Group determined that while the access to post-secondary education was inequitable across the province, the demand for such opportunities was not uniform, and that the nature of the regional workforce was a factor influencing supply and demand patterns. Specifically, the demand for upgrading in professional areas appeared to be heavily urban-based, whereas demand for services in vocational and technical areas was widespread (Carney, 1977) underscoring the need for access to technical knowledge throughout the province.

The BCIT Prospectus in Distance Education (1978) accurately predicted “that post-graduate and certification training promises to be one of the most rapidly growing fields of distance education at BCIT” (p.27). In the early 1980s, identification of a demand for post diploma programs to be available to practising technologists provincially and nationally resulted in a significant increase in distance education courses and sophistication in flexible delivery modes. Spearheaded by the School of Health Sciences, distance education post diploma
courses leading to an Advanced Diploma credential were developed first for nursing specialties where there was an unmet need such as psychiatric nursing and medical/surgical nursing. The success of these innovative delivery methods in addressing upgrading needs throughout the province resulted in government transferring all post basic nursing programs to BCIT in 1985. Additional Advanced Diploma programs were developed for distance delivery in the areas of health, business and engineering in the latter half of the 1980s. The formation of joint degree partnerships between BCIT and OLA in 1991/1992 added significance to BCIT’s advanced level distance education courses, legitimising them as the first baccalaureate level technology courses in Western Canada. Following the enabling legislation in 1995, BCIT now offers distance education opportunities in most of its Bachelor of Technology degree programs.

**Governance**

BCIT was established as a provincial institution under the direct control of the Department of Education through the vehicle of an Advisory Council established in 1961 by the Minister of Education and chaired by Dr. J.F.K. English, Deputy Minister of Education. The Advisory Council, consisting of respected leaders in the business, medical, engineering and educational fields (Carey 1975), was mandated to provide direction and guidance in the planning and the ongoing operation of the institution but was not given the executive authority enjoyed by university boards. White suggests one of the main reasons for this can be attributed to the federal-provincial cost sharing arrangements (Carey 1975).

Legislative authority for the creation of an autonomous Board of Governors for BCIT was passed in 1974 by the Minister of Education, the Honourable Eileen Dailly, during the NDP government's term of office. The Institute of Technology Act placed the management of
BCIT and final responsibility for all educational programs in the jurisdiction of the BCIT Board of Governors. Board membership included external appointees and internally elected members from faculty and students.

In 1977 the College and Institutes Act, Bill 82, was proclaimed, promoted by McGeer, with the intent of governing all British Columbia community colleges and institutes, including BCIT. This implied that the Institute of Technology Act would be repealed. Strong arguments from the BCIT Board of Governors and industry lobbyists to retain its own Act under which it could pursue a distinct identity (Dennison 1992), resulted in the Institute of Technology Act being retained as the governing statute. Nonetheless, BCIT had to report through the Bill 82 structure for financial and program decisions. Under the new governance structure faculty and students were removed from the Board of Governors. Members were external appointees or elected members from program advisory committees. In 1983 an amendment, to the Technical Institute Act, Bill 19, removed elected advisory committee members from the Board of Governors, membership was totally external and appointed by the Lieutenant Governor in Council.

**Educational Council**

Removal of faculty and students from the Board of Governors as a consequence of the College and Institute Act (1977) prohibited formal input from the internal academic community into educational policy development. Internal consultation was consequently sought through the creation of BCIT's first Educational Council in 1979 by Gordon Thom, Principal of BCIT. The main reasons for establishing the Council were: “to recommend educational policy to the Board, to improve communications on educational matters within BCIT and to facilitate consultative management” (BCIT, 1981b, p.52). The Educational
Council acted in an advisory capacity only. It was not recognised in legislation and consequently had no legislated authority. The Educational Council was subsequently disbanded in 1985 by President Roy Murray at the time of the amalgamation with PVI. Murray rationalised that, given the amalgamation of the two institutions, the whole area of faculty and student input into the decision making structure warranted review. The Educational Council was reconstituted again in March 1987 following a motion by the president to the Board of Governors.

The Second Decade: Role Definition

The second decade in BCIT's history was heralded both by a change in Principal, Dean Goard retired in June 1974, and Gordon Thom, Vice Principal of the Extension Division was appointed as his successor, and by a significant change in governance. The Institute of Technology Act (1974) removed BCIT from direct control of the Department of Education and created an autonomous Board of Governors.

The period 1976–1987 was one of intense planning activity as both the province and the Institute sought to determine the future direction and mission of BCIT. BCIT was the focus of a plethora of task forces, study groups and planning committees, some constituted by internal directives and some government driven. In 1976-77, BCIT established a formal strategic planning process to develop a Five Year Plan for the Institute. The planning was scheduled to progress in four annual stages and was to enable stakeholder groups, faculty, staff, students, administration and the Board of Governors to come closer to consensus as to the direction of BCIT. This planning activity was concurrent with and partly shaped by the provincial government's stated intention to incorporate BCIT under the College and Institute
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Act. Major implications for BCIT were, the threat of formula funding, "that BCIT would be tossed into the pot with all other colleges and would just be looked at as another regional institution" and, that the Board of Governors would lose representation of faculty, students and possibly Advisory Committee members. BCIT stakeholders have always regarded the advisory committee infrastructure as fundamental to the success of BCIT in fulfilling its mandate.

Much of the emphasis in the planning sought to develop strategies to differentiate BCIT from the colleges and hence retain its own Act. To this end, two Institute task forces were established within the overall strategic planning initiative. First, the Task Force on Institutional Differentiation was charged "to prepare a report on those factors which establish the uniqueness of BCIT in the higher education system of the province" (BCIT, 1980c, p.1). In 1968-69, BCIT provided 76 percent of all career/technical training in British Columbia. However, by 1980 with the growth and maturing of the community college sector that proportion had declined to 42 percent (BCIT, 1980c). A blurring of the mandates was occurring and as a former President of BCIT recalls "we were trying to differentiate ourselves and our product from the product of the colleges." Second, the Post Diploma Task Force studied post diploma needs in technological education in the province. A wide spectrum of needs was identified depending on the program and ranging from no post diploma programs in some areas to a baccalaureate degree in others (Svetic, 1978). BCIT focused its planning on seeking an advanced technology mandate, thus defining BCIT's unique position as "one of provincial leadership in technological education" (BCIT, 1979, p.7) and consequently differentiating itself from the community colleges:

the Institute is prepared to concentrate on upper level training in existing programs and develop new programs in what can be defined as higher technology.....we are prepared to assist colleges in developing the first year program for transfer into
second year at BCIT, or where feasible, to assist them in developing a full two year program. Graduates of this two year diploma program would then be eligible for a possible third or fourth year at BCIT (BCIT, 1979, p.14).

BCIT: A Polytechnic?

Considerable debate occurred in the late 1970s regarding the possible evolution of BCIT into a polytechnic. The following excerpts indicate that this initiative was driven by McGeer, Minister of Education:

It was duly MOVED, seconded and CARRIED that the Board of Governors receive the letter from the Minister and accept the Minister’s challenge of a new role for BCIT.\(^{14}\)

I am delighted to report that the correspondence between yourself and Paul Trussell, dated September 12 and 21 1978, concerning the evolution of BCIT into a Polytechnic, was tabled with the Board last week and was enthusiastically received.\(^{15}\)

Interview data was contradictory on this point. Two former senior administrators of BCIT acknowledged that while the evolution to a polytechnic had support of McGeer, it was initiated internally by BCIT’s administration. In contrast, a senior manager involved “only peripherally at the time” recalled that “Victoria initiated the change, and then when resistance appeared, left the administration to carry the can.”\(^{16}\) McGeer was interested in promoting scientific research and technological development in the province as evidenced by his introduction of Discovery Parks. As a former Vice President, Education pointed out, “both McGeer and his deputy, Hardwick, saw that BCIT could provide the type of graduate that would fit into that environment but to be accepted into research in a serious way, really, someone should be entering at the degree level to have it recognised as an academic component.”\(^{17}\)
The polytechnic concept generated a significant amount of controversy and negativity within BCIT’s internal community. Concerns from both students and faculty, however, stemmed from the process, specifically lack of communication, rather than the substance of BCIT becoming a polytechnic:

For some reason however the Board didn’t see fit to tell anybody else what they were doing. Nobody knew what the Polytech concept was, or how it would affect the present Diploma programs. The little information that was available at the time led many to believe that the Board has already decided to proceed with turning BCIT into a degree-granting institute. This made many, the faculty in particular, as evidenced at the Polytech Forum, feel as though they were not to be consulted and to have this change forced down their throats.\(^{18}\)

The BCIT Staff Society is not opposed to change or to the evolution of BCIT into a different kind of institution. However we feel obliged to communicate to the Board that there is strong disagreement among our members on this matter, and to recommend to that the Administration of BCIT be instructed to implement immediately thorough discussion with all the constituencies of BCIT.\(^{19}\)

Paris (1979) blames lack of faculty consultation and support on BCIT’s unicameral governance structure:

There is something wrong when a decision can be made involving basic academic policy without adequate consultation with faculty and the communities being served. The fundamental problem rests in the structure of governance at BCIT which has no role for the academic community in academic decision-making.\(^{20}\)

Agreement with Paris’s assessment was implied some 17 years later by a former Vice President, Education, BCIT who postulated that the presence of Education Council as a vehicle for faculty input was one of the major differences that resulted in a successful degree initiative in the 1990s. Discussion of the expanded role for BCIT and possible evolution into a polytechnic was not resolved. McGeer was succeeded as Minister of Education by Mr Brian R.D. Smith in 1980.
Ministry Investigations

In the early 1980s, the rapid expansion of a knowledge based economy was revealing a serious shortage of skilled manpower, both provincially and nationally. The Human Resource Survey, *Skills and Shortages* (1980), sponsored by the Economic Council of Canada, identified a scarcity of engineers and certain related technologists. The problem was exacerbated by a decreased supply of skilled immigrant labour. Accordingly, Canada had to meet her occupational requirements increasingly through the domestic development of human resources (Betcherman, 1980).

To determine the status of British Columbia’s technological manpower, in 1980, Smith, Minister of Education, struck two inter-related investigative groups that were to have immediate influence on the direction of BCIT’s advanced technology mandate. The Task Force to Examine Technological Training in Engineering, Health Science and Related Fields in British Columbia, chaired by Dr. J. Sample, Director, TRIUMF, was provincially focused and the Committee to Examine the Extension of Training at BCIT, chaired by Dr. Grant Fisher, Assistant Deputy Minister, was institutionally focused. These two ministerial study groups were essentially investigating “the current capability of the educational system in B.C. to provide polytechnic education as well as attempting to evaluate the current but more appropriately the future, needs of industry for polytechnic graduates” (BCIT, 1981b, p. 15).

BCIT’s submission, *Vision and Decision* (1981); to these two Ministerial study groups, incorporated findings of several previous internal investigative committees, specifically the Post Diploma Activities Committee, and the Task Force on Institutional Differentiation. *Vision and Decision* (1981) argued strongly for polytechnic education in British Columbia, and for BCIT evolving into a polytechnic institution offering post diploma programs up to the
baccalaureate level, consequently occupying a distinctive niche within the post-secondary system. The collective findings of the two ministerial study groups endorsed the need for post-diploma specialty training in certain technological areas but did not perceive a need for baccalaureate recognition of technological education at that time. BCIT responded to the identified need. In 1985 Advanced Studies programs were started in the School of Health Sciences, followed by Engineering Technology in 1987 and Business in 1989.

Despite what appeared to be support from the Ministry, the thrust towards a polytechnic and consequent degree granting status seemed to evaporate. It was impossible to determine any single reason for this, rather a combination of economic and political circumstances. Prior to 1980 BCIT enjoyed a period of vigorous expansion. However the economic recession of the early 1980s coupled with the imposition of formula funding resulted in severe financial constraints on BCIT. As a former President of BCIT recalls, “we started focusing much of our planning on just trying to survive and justify our differences at the basic level, so our energy was consumed in that.”²² A former Board member and former President concur that “colleges were coming on to the scene and being given heavy priority on the part of government”²³ and “Hardwick wanted to create a series of institutions but didn’t want to see any of them very powerful.”²⁴ Politically, while government originally supported the polytechnic concept, pressure was brought to bear from both the universities who saw BCIT as a potential competitor and from the colleges arguing that BCIT should not be singled out to follow this new direction.²⁵ The political situation was complex, and potentially contradictory in terms of policy. On the one hand, government declined to set BCIT apart by insisting that it be legislated under the same Act as the colleges, yet on the other hand supported giving degree granting status to BCIT which would differentiate it from the colleges. Government attention was confounded further by frequent change of Ministers
during this period. Furthermore, no clear support existed within BCIT for this initiative. The internal dynamics will be discussed further in Chapter Six.

The Third Decade:
A New Institution — A New Mandate

The Merger of BCIT and PVI

On May 31, 1985, the Minister of Education, the Honourable Jack Heinrich announced the amalgamation of the Pacific Vocational Institute (PVI) and BCIT. The enabling legislation, Bill 72, the Pacific Vocational Institute and British Columbia Institute of Technology Amalgamation Act came into force, April 1986. The merger of PVI with BCIT made the “New BCIT” the most comprehensive trades and technology institution in British Columbia. The syllabus now included vocational/technical programs to complement and enhance those in technology:

The new British Columbia Institute of Technology will, in the words of the Minister of Education, provide a centre of excellence for high-technology training, capable of transforming the high school graduate into a highly competent tradesman and/or technologist (Debates of the Legislature, (Hansard), November 25, 1985).

The incumbent president of each institution was retired and Roy Murray was appointed President, Principal and Chief Executive Officer of the “new BCIT” as of July 1, 1985.

The merger of these two culturally different institutions occurred for both political and financial reasons and was received badly by both campuses. The PVI community envisaged loss of identity and being swallowed up by the larger institution. According to one faculty member, fears of the BCIT community were “based on memories of when BCIT first started and how hard we worked to say we were different from a vocational school.” An alumnus
recalls, “we early graduates had to go sell our credentials for BCIT because no one understood them.”

Since its introduction in the 1960s, the BCIT Diploma had gained prestige in the workplace. The merger was seen as a retrograde step which, in the opinion of an alumnus and current member of the corporate sector, “would inject confusion into the employment market and potentially then devalue the diploma for grads coming out.”

The period between 1985–1988 was one of adjustment as both internally and externally the new institution sought direction. Internally, the administration imposed frequent changes in organisational structures which was interpreted as indecision. The result was contempt for change and consequent frustration and low morale within the campus community.

Externally, BCIT and the Ministry sought to define a niche in the post-secondary system for this new institution.

The significance of the merger of BCIT and PVI stems from the vision for the new institution embodied in the following statement:

The goal of the merger was to create a flagship; an institution that would assume a fundamental role in the province’s economic strategy, could provide pedagogical leadership to the system and would stand as an international beacon for excellence in technology training and education.

However the government expressed concern that, “the Institute of Technology remains essentially indistinguishable from the college sector. There exist few elements that portray it as having a unique role within the post-secondary system.”

BCIT was directed to examine its structure and review the necessary steps to attain and maintain world-class status as an institute of advanced technology. To this end, in August 1987, the Honourable Stan Hagen, Minister of Advanced Education and Job Training, struck a one person task force, David Park
of Western Management Consultants Vancouver, "to assist in charting the future course for the British Columbia Institute of Technology" (Park, 1987, p.1). Hagen rationalised:

the ability of British Columbia to adapt to new technology will be a significant factor in our future economic well being ... assuring that economic well being means making sure that our institute of technology is providing the right technological training.\textsuperscript{33}

The task force was mandated to conduct program audit and recommend program changes refocussing BCIT toward high technology consistent with the expressed desire of the provincial government for a world class institution of technological education.

BCIT's submission to Commissioner Park, \textit{Economic Development through High Technology}, (1987) focused on three areas: applied research; degree granting status; and, cooperative program relationships with the college sector. The major thrust of the submission recommended that BCIT should develop a Centre for Applied Technology to engage in applied research, innovative assistance and technology transfer to business and industry. It was argued that, although there was a great need for technology development in Canada and British Columbia, a greater and more urgent need existed for technology transfer and that the Canadian post-secondary system was unable to facilitate the applied research and technology transfer required to keep Canada internationally competitive. The recommendation for a Centre of Applied Technology also had political significance. This will be addressed in Chapter Six.

The Task Force, while endorsing BCIT's proposal and model for a Centre of Applied Technology, disagreed with BCIT being the appropriate site for this development. Rather, Park recommended the establishment of a small, elite College of Advanced Technology, accessible to only the brightest graduates of diploma programs. Park maintained that the
Centre of Applied Technology should be housed in this institution. The most serious implications of the Park Report, however, were its implications for funding. BCIT would be returned to formula funding which meant that many programs and faculty positions were threatened and BCIT's uniqueness in the post-secondary system would be severely jeopardised.

The Park Report was the culmination of a turbulent period in BCIT's history. The early and mid-1980s were tough years marked by even tougher budgets and strained relationships both internally and externally. Internally dissatisfaction existed due to lack of confidence by faculty in the institutional management and administration, fuelled partly by frequent organisational changes and poor communication. Externally:

BCIT had a lousy reputation in Victoria and around the system. We were seen as an elitist, expensive and out of touch institution, living on past glories and the connections we had with a previous government. Some senior staff in Victoria disliked us and were not sympathetic to our needs. The colleges were tired of BCIT claiming it was different and should be treated better than them.34

BCIT had not marketed itself well during this period. A clear understanding of BCIT's function and role in the post-secondary system was lacking. The amalgamation with PVI added to this uncertainty. Following the Park Report, BCIT was singled out for severe budget cuts totalling approximately four million dollars out of a total budget of $78 million, implying program deletions and substantial faculty lay-offs. Government's intent was to redistribute these monies throughout the post-secondary system.35 Notably, the “Access for All” initiative was being formulated at this time.

Despite the ramifications to BCIT of a four million dollar budget reduction, a faculty member recalls that the President was instructed by government “not to make an issue of this.”36 Consequently the BCIT Staff Society became aggressively involved, developing a multi-
faceted media campaign, which made a major issue out of budget and argued that BCIT had been targeted unfairly. The result was a tremendous outcry from business and industry, who lobbied unrelentingly alongside all sectors of the BCIT community. The outpouring of support culminated in a mass protest in the BCIT gymnasium in May 1988, attended by both internal and external communities. At the “eleventh hour” the government changed its position. The budget reduction was rescinded with a promise of no lay-offs. Furthermore, government rejected recommendations of the Park Report that BCIT should continue virtually unchanged. Rather government concluded that BCIT had the potential for assuming the flagship role previously envisaged. BCIT was designated as the Centre of Advanced Technology for the province with an assurance of funding to realize this new mandate. In the opinion of one faculty member, “the change in mandate was the way they justified the reinstatement of the money.”

A New Mandate

In September 1988, Hagen, Minister of Advanced Education, Training and Technology, announced BCIT’s new mandate, providing a definite shift in focus for the institute with an “advanced technology” mandate. The mandate stated:

The British Columbia Institute of Technology will be an innovative and flexible advanced technology enterprise which will focus on those initiatives that increase the level of entrepreneurial activity within the province. Specifically, BCIT will:

- establish expertise in specific technological areas and develop applications for British Columbia business and industry;
- facilitate technology transfer by providing innovation, industrial assistance and contracted applied research; and,
- provide a highly trained work force vital to the establishment and continuance of advanced technology in British Columbia (BCIT, 1990, p.2).
The new mandate focused BCIT's responsibility for training on advanced technology knowledge and skills. Programs were to be transferred both in and out of BCIT and existing programs significantly enhanced with new technology. The new mandate added a second responsibility, Technology Transfer and Contract Applied Research, making BCIT the only post-secondary institution in the non-university sector specifically mandated to engage in research. Dr. Jack Newberry, Director of Universities and Provincial Institutes, was assigned to work with BCIT to develop the new mandate and to implement changes to the program profile (Gillespie 1989). In discussions of the proposed new mandate:

Dr. Newberry stressed that the order in which the components had been listed was significant. It focused on functions that were clearly different from the colleges and while the training component was important it was different from the training functions of colleges. He emphasised that it was extremely important for BCIT to be clearly and significantly different from the colleges. 39

**New Directions: The Technology Centre**

The BCIT Technology Centre was established in 1989 as a result of the directive in the Institute’s new mandate, that BCIT should facilitate technology transfer by providing innovation, industrial assistance and contracted applied research. The Technology Centre was established by amalgamating smaller areas of BCIT already engaged in industrial assistance activities. These areas had been created as a result of individual initiatives and were operating somewhat outside the mainstream of BCIT’s educational objectives (Streat 1992).

The Technology Centre performs a liaising function that benefits both internal and external communities. First, it fosters economic development in the province by providing access to the vast pool of expertise at BCIT. Business and industry are networked with faculty and staff on the development of industrial uses for new technologies and in the implementation of new technology. Second, BCIT staff have the opportunity to maintain and expand their currency.
Contracted and applied research, technical visitation programs, technical services and industrial technology training enable instructors to remain current and to develop new expertise. In turn, new technology knowledge and applications are returned to industry through BCIT graduates. The new mandate, however, did not change the required duties of most BCIT faculty. All faculty were not expected to engage in research activities. However, as BCIT sought degree granting status the applied research aspects of the mandate were significant because they offered an opportunity for BCIT to demonstrate a level of scholarship consistent with the Institute's degree granting aspirations (Streat, 1992, p.4).

The turbulent times of the 1980s, discussed previously, coupled with several years of zero salary increases and constant issuing and rescinding of lay-off slips fostered a climate of discontent on campus. Elsewhere in the public school and post-secondary system six and seven percent salary increases funded by the government's budget stabilisation fund were becoming a reality. In April 1989, BCIT experienced the first faculty strike in its twenty five year history. In the opinion of one faculty member, “there was no single cause for the strike; everyone had their own reasons.” The strike was not inspired by the union executive. On the contrary, the union leadership was surprised at the faculty’s unanimity and determination. The strike lasted two weeks.

**New Leadership**

Roy Murray resigned as President of BCIT effective March 1, 1989 and John Watson, formerly the Assistant Deputy Minister with the Ministry of Advanced Education and Job Training, was named as his successor, this announcement having been delayed until the strike was settled. Watson took office on June 1, 1989 and focused on rebuilding relationships and institutional credibility both internally and with government and industry. Watson recollects
his: “first and major issue was to settle the place down...the Institute had been pretty beat up for several years by government, by reorganisations and by labour strife and I determined that it needed a calm and steady hand to settle it down.” Watson’s open and consultative style of management coupled with his personable manner of interacting with individuals renewed trust and confidence in institutional leadership and fostered a noticeable change in climate on campus. Externally, efforts were made through improved communication strategies with government to get better funding and increased political support at the senior bureaucratic level. As an Assistant Deputy Minister recalled, “John was the only president that I was in regular e-mail communication with and that’s right from the first day that he moved into the president’s job at BCIT.” Improved relations with the post-secondary system were realised through BCIT becoming involved in provincial organisations and committees and assisting smaller colleges. These efforts translated into credibility and support from the Ministry, creating an enabling environment for future initiatives such as Bachelor of Technology degrees, the Downtown Education Centre and the “matching funds” fundraising initiative.

The appointment of a new president was accompanied by major changes at the administrative and senior management level, a new leadership team for BCIT. In December 1988, a new Dean was appointed to the School of Health Sciences, followed by the appointment of Deans to the School of Business and the School of Engineering Technology in May 1989, and to the School of Trades Training in February 1990. A re-organisational pilot project merging programs in related occupational clusters from trades and technology programs formed the School of Electrical and Electronics in January 1993 with its own Dean, and a new school, the School of Computing and Academic Studies, was added in April 1994. At the administrative level, a new Vice President, Student Services and Educational Support was
appointed in June 1990 and an Executive Director of Marketing and Development, later to become Vice President, External Affairs, joined the team in August 1990.

Throughout the 1980s, contact between BCIT, industry and the employer had gradually become less intimate. Rebuilding working relationships with industry was a priority for the new management team. Emphasis was placed on revamping of advisory committees, meeting with employers, joining industry associations and generally seeking input as to how BCIT could best meet the current needs of industry. This collaborative approach embraced industry as a working partner in any new venture such as degree granting.

New Governance

The more open and consultative style of the new President and his administrative team was evident in institutional governance. While no legal requirement for internal representation on the Board of Governors existed, both the Board and the senior administration recognised the benefits of collaborative input. In November 1990, following a recommendation from the President, and in a move to improve the credibility of Educational Council, the author as Chair of Educational Council was invited to participate as a non-voting member both of the Board of Governors and the Education and Student Affairs Committee of the Board. Subsequently, the Board voted to appoint further non-voting members, elected from the internal community: two staff and one student representatives. This was a positive step and symbolized the changing climate on campus. Moreover, it was an indicator of a provincial move to change governance procedures in colleges and institutes.

Governance of British Columbia's post-secondary institutions was re-visited in 1992/93 by the Carter Committee on Governance of Colleges and Institutes, precipitated by the imminent
designation of institutions in the non-university sector as degree granting institutions. Long
debate ensued. Bills 22 and 23 amending the College and Institute Act and the Institute of
Technology Act respectively were enacted in January 1995. As the Honourable Dan Miller,
Minister of Skills Training and Labour explained:

The principal aim of these amendments is: 1) to give university colleges and
provincial institutes the power to grant baccalaureate degrees and honorary degrees;
2) to include internal institution members on the boards of colleges, university
colleges and provincial institutes; and 3) to create an education council within each
institution.\(^{48}\)

The recommendations of the Carter Committee on Governance of Colleges and Institutes and
consequent amendments to the Institute of Technology Act (1995) resulted in an Education
Council\(^{49}\) being a legislated requirement for all colleges and institutes. The Act specified
Council membership, designated areas of legislated authority and, furthermore, provided
linkage with the Board of Governors by legislating the Chair of Education Council as a non­
voting member of the Board of Governors.

New Challenges

In 1990, the Ministry of Advanced Education, Training and Technology initiated a strategic
planning process to explore future directions for post-secondary education in British
Columbia and required all post-secondary institutions to submit their own strategic plans to
feed into this process. The major government priorities were identified as Economy,
complied with this requirement and charted the future direction of BCIT in response to its

The strategic direction chosen by the British Columbia Institute of Technology is to
enhance the quality of its programs to the point that BCIT is acknowledged as the
best educational institution of its kind, (p.vii).
BCIT’s philosophy was initially to “start with our strengths — confirm them, reinforce them, and build on them” (BCIT, 1991, p.2). Externally this translated into serving the advancing needs of BCIT’s confirmed market niche and concurs with Moran’s (1991) assertion of establishing institutional legitimacy by building on uniqueness. Internally strategies formulated to implement the plan involved identifying “areas of emphasis,” specific program areas for focus.

With diminishing fiscal resources the post-secondary environment was becoming increasingly competitive. The “Access for All” initiative elevated the status and legitimacy of some institutions in the non-university sector by designating them degree granting institutions. BCIT, albeit the provincial leader in technological education, recognised that to remain viable it too must strive for a new level of formal legitimacy through degree granting authority. The President’s vision statement of BCIT’s strategic plan acknowledged that, “we need to develop new and renewed credentials to reflect 21st century needs for employers and graduates (BCIT, 1991, p.vi). The Bachelor of Technology degree was envisaged within this strategy. A detailed account of the Bachelor of Technology degree initiative is the focus of Chapter Six.

The timing of this endeavour was fortuitous. In the early 1990s, a distorted, academically biased education system, coupled with provincial concerns of an inappropriately trained labour force and shrinking resources, encouraged a shift in government policy towards emphasizing more employment relevant education, skill development and training. For the Premier of British Columbia:

The goal is simply to better equip British Columbians with the skills they will require to succeed in the 21st century (MSTL, 1993, p.3).
The Premier’s Summit — Skills Development and Training — was convened at BCIT in June 1993 to address future education and training needs of the province. The “Skills Now” initiative was an outcome of the summit. According to a former Minister, “Skills Now” was “an attempt to deliver more education and training throughout the province with less money per unit.” The BCIT Bachelor of Technology degree was a component of the “Skills Now” package announced in May 1994 (Appendix 5A), and was part of government’s strategy to shift focus from traditional university offerings. Enabling legislation designating BCIT a degree granting institution was enacted on January 15, 1995 (Appendix 5B). Elevation to degree granting status is perhaps the most significant milestone in BCIT’s history since its inception in 1964.

Significant expansion of BCIT’s facilities occurred in the mid 1990s. In 1994, BCIT merged with the Pacific Marine Training Institute, North Vancouver, and in 1996 BCIT opened a new eight storey Downtown Education Centre touted as one of the fifty “smart” buildings in the world and one of ten in Canada. Both ventures foster innovative linkages between BCIT and the corporate sector in keeping with BCIT’s mandate.

Summary

BCIT was built in the early 1960s to address the need for advanced technical training in the province and was a joint federal/provincial undertaking funded through the Technical and Vocational Training Assistance Act (1960). The Institute opened in 1964 offering full time day school programs only. The first decade of operation was marked by vigorous expansion both in capital facilities and consequent student population. During this period BCIT diversified its delivery modes. The Extension Division for part time studies was added and
Distance Education opportunities were introduced. In contrast, the second decade was one of considerable turbulence, due to both the fiscal restraint years of the early 1980s and increasing competition from the community colleges. BCIT was subjected to numerous task force investigations to determine its strategic direction and niche in the post-secondary environment. The amalgamation with PVI in 1985 heralded the third decade in BCIT's history. The "New BCIT" received a new mandate in 1988 providing a definite shift in focus towards advanced technology programs and mandating BCIT to engage in applied research. The shift in institutional profile coupled with the introduction of degree granting in the non-university sector motivated BCIT to seek degree granting status in early 1992. BCIT was legislated as a degree granting institution in January 1995.

Footnotes

1 Mr J.M. Miller, Secretary, Management and Development Committee, MacMillan and Bloedel Ltd.: Input to the Bridge/White survey.
3 Mr W.R.C. Jones, V.P. Industrial and Public Relations Department, Powell River Co. Ltd. Vancouver: Input to the Bridge/White survey.
8 Former President of BCIT: Interview, October 1, 1996.
9 Department Head Meeting Minutes, September 14, 1965.
10 Minutes, Board of Governors Meeting, November 2, 1985.
12 Former Vice President, Education, BCIT: Interview, October 7, 1997.
13 Former President of BCIT: Interview, October 1, 1996.
14 Minutes, Board of Governors Meeting, November 28, 1978.
Mr. M.C.D. Hobbs, Chairman of the BCIT Board of Governors, to Dr. P.L. McGeer: Letter; November 30, 1978.

Opinion expressed by a senior manager when performing a "member check" of interview data.

Former Vice President, Education, BCIT: Interview, October 7, 1997.

BCIT student newspaper, The Link, January 24, 1979.

C.M. Briscall, President, BCIT Staff Society to Michael Hobbs, Chairman, Board of Governors: Letter, January 24, 1979.


The Post Diploma Activities Committee was a committee formed subsequent to and at the recommendation of the Post Diploma Task Force.

Former President of BCIT: Interview, October 1, 1996.

Executive Director of Applied Science Technologists and Technicians, British Columbia and former BCIT Board of Governors member: Interview, August 15, 1996.

Former President of BCIT: Interview, October 1, 1996.

Former Vice President, Education, BCIT: Interview, October 7, 1997.

Former President of BCIT: Interview, October 1, 1996

Faculty Member: Interview, September 26, 1996.

Former Chair of BCIT Board of Governors and alumnus: Interview, September 16, 1996.

Member of the corporate sector and alumnus: Interview, October 10 1996.

Faculty Member: Interview, September 26, 1996

Rationale for a Program Audit, presented to the Board of Governors by the Ministry, August 10, 1987.

Ibid.


Former President, BCIT: Interview, August 4, 1995.

Former Member of the Staff Society Executive heavily involved in the negotiations around these issues: Telephone interview, December 3, 1996.

Ibid.

Minutes, Board of Governors meeting, June 28, 1988.

Former Member of the Staff Society Executive heavily involved in the negotiations around these issues: Telephone interview, December 3, 1996.

Minutes, Board of Governors, June 28, 1988.

Faculty Member: Interview, September 26, 1996.

Ibid.

John Watson to Ann McArthur: E-mail communication, December 2, 1996.

Assistant Deputy Minister: Interview, August 30, 1996.
Following the amendments to the Institute of Technology Act (1995), Educational Council was renamed Education Council to conform to the wording in the Act.
Chapter Six:
The Bachelor of Technology Degree
The recognition of technological education to the baccalaureate level, as legislated in 1995, represents the culmination of two decades of preparatory work and advocacy. This chapter focuses primarily on the two periods in BCIT’s history where the institute sought degree granting authority. A series of task force investigations in the early 1980s provide both a chronology of events and identify issues surrounding the bid for degree status in the early 1980s. The chapter describes the planning approach and the sequence of events that led to the successful bid for degree granting in the 1990s.

Degree Granting Status: Divided Opinion

The vision of BCIT as a degree granting institution spreads over two decades. In 1974, the Honourable Ms. Eileen Dailly, Minister of Education, appointed a Task Force to determine advantages and disadvantages of the proposed change of governance to BCIT. Terms of reference for this task force included:

- to recommend the content to be considered in the preparation of any draft legislation which might be introduced at the next sitting of the legislature (Department of Education, 1974, p.1).

The Task Force considered that, in addition to the two year diploma, BCIT may offer a three year diploma and a four year degree. Opinion was somewhat divided. The consensus that emerged was that while “such programs should not be prohibited by the proposed legislation, they would be the exception rather than the rule” (Department of Education, 1974, p.3).

The decade 1977–1987 was one of intense planning activity as both government and the institute tried to identify the role of BCIT in the economic future of the province. As outlined in the previous chapter, BCIT was the focus of a profusion of task forces, study groups and planning committees. The question of degree granting status was a recurrent theme. Initial
investigations were internally driven whereas later ones were initiated by government, in response to the shift in the economic base of the province and the consequent need for higher technological skills.

**Building a Case**

Two concurrent but inter-related activities pertaining to BCIT's future direction took place in the latter half of the 1970s, the overall strategic planning for the institute and within this, the specific investigation of potential post diploma activities. The strategic planning process introduced in 1976–77, first as a BCIT initiative and later as a Ministry requirement to develop a five year plan for the institute, identified pressures early in the process for the expansion of BCIT's role. The report of the first phase of the planning process states:

> BCIT must consider more advanced training for specialist technologists and retraining to keep technological graduates current (BCIT, 1977, p.7).

Responding to an apparent need for advanced technological training and to keep abreast of rapid technological change, an institute wide task force, the Post Diploma Task Force, was established in 1977 to study post diploma needs in technology within British Columbia. A wide spectrum of needs was identified, depending on the individual program, ranging from no post diploma programs in some areas to a Bachelors Degree in others (Svetic, 1978). The task force findings indicated that considerable post diploma activity was occurring as part of the current programs. For example, Medical Laboratory graduates were required to spend a year in a supervised hospital setting upon graduation whereas for Environmental Health graduates, summer training was a requirement. However, this additional training was not recognized as a formal educational requirement. The Post Diploma Task Force recommended "that BCIT actively pursue post diploma activities and that the Deans’ Committee consider pilot projects" (Svetic, 1978, p.2). Consequently the Post Diploma Activities Committee
Chapter Six: Bachelor of Technology Degree

chaired by R. C. Mason, Dean of Engineering, was established by the Deans’ Committee in the spring of 1979, charged with reviewing the possible structure of post diploma activities at BCIT and with soliciting input from the BCIT community on that structure (BCIT, 1980b). A White Paper on Post Diploma Structure at BCIT drew response from both internal and external stakeholder groups. Specifically, a position statement from the professional body, the Society of Engineering Technologists of British Columbia (SETBC) provided a rationale for post diploma training from the perspective of empowerment of the individual rather than provincial economics:

the technologist is currently seeking additional training, not only to maintain technical ability, but also to advance technical and professional ability, whether as a technical specialist or as a manager. It is clear then, that post diploma of technology courses and programs are in demand, to satisfy the needs of individuals in their career advancement and the needs of certain industries where existing diploma and degree programs do not provide the pre entry training required.¹

SETBC, while supporting post diploma of technology programs, recommended that: priority be given to structuring these for part time students; the credential awarded be a Bachelor of Technology degree; and, BCIT be designated as a degree granting institution to offer this degree. The rationale for this recommendation alluded to the lack of incentive for diploma graduates to pursue a university degree because of articulation difficulties, and argued that “a complete career path must be available in order that a technologist can fully complete his/her role in industry.”²

Although all three of the SETBC recommendations have proved significant in the ultimate designation of the post diploma credential for technological education, of particular significance is the clear differentiation SETBC provided in its vision of a Bachelor of Technology degree:
Bachelor of Technology must be designed to produce a technologist with more advanced technical skills, rather than preparing to become another recognized professional whose training is achieved through a university.\textsuperscript{3}

The \textit{Report and Recommendations of the Post Diploma Activities Committee} (September 1980), submitted to the Deans' Committee included the following recommendations:

The British Columbia Institute of Technology will develop post diploma programs leading to granting of degrees (p.2).

The British Columbia Institute of Technology should be designated by appropriate governmental action as a degree granting institution (p.2).

Initial investigations of the Post Diploma Task Force had identified a spectrum of needs dependent on the program, therefore a further recommendation of the Post Diploma Activities Committee was that:

Degree programs at the British Columbia Institute of Technology should be offered in those disciplines where there is a discerned need, and only in those disciplines where there is that discerned need (p.3).

All three of these recommendations were ultimately realised but not until fifteen years later.

The work of the Post Diploma Activities Committee was fuelled by evident government interest in an expanded role for BCIT, possibly to a polytechnic, evidenced in the dialogue between the Board of Governors and the Minister, discussed in Chapter Five. In his \textit{Proposal for the Evolution of BCIT into a Polytechnic}, (1978), Svetic, Vice Principal, Education states:

The Minister has recognized the need for technological expertise beyond what is currently available, and has therefore requested BCIT to redefine its role. It is understood that formal post diploma education up to and including a Bachelor of Technology is to be considered (p.3).

Internally, however, there was a lack of faculty support for degree level studies. Apprehension about job security due to inadequate academic credentials may have been an
underlying issue, however concern focused primarily on the effect of degrees on the validity of the two year diploma. One faculty member explains, “BCIT had struggled to establish an identity and a reputation for producing job ready graduates. Faculty were proud of that and didn’t want anything to detract.”4 Anxieties were triggered in part by the “Ryerson experience,” where introduction of degrees had resulted in the demise of the diploma program. BCIT initially modelled itself on Ryerson, had “a vision of being the Ryerson of the West,” and did not want to make the same mistake.5 A former Vice President, Education drew attention to the fact that Ryerson offered four year degree programs not restricted to selective areas, thus totally different from BCIT’s intended approach, did not seem to matter. “It was looked at as something that didn’t work.”6 Government and industry argued in a similar vein, that a degree program serving approximately 10 percent of the student body would attract the best faculty and the best resources, possibly jeopardising the quality of the diploma program for the remaining 90 percent of the students.7

External Influences

In 1980 the Ministry of Education, Science and Technology required Five Year Plans from all colleges and institutes in the province. BCIT’s Educational Five Year Plan: Introduction to the Eighties 1979–85, was a review of the third part of the internally driven four phase planning process underway at that time and represented a consolidation of individual departmental and divisional plans for the academic years 1979/80 to 1984/85. The Five Year Plan incorporated the findings of the Post Diploma Task Force and argued strongly for the provision of advanced technological training beyond the basic two year Diploma of Technology:

Although the need for diploma graduates is increasing, both in types of programs and numbers, some industries are indicating a need for employees who are trained beyond the diploma level. It is clear that what they want from BCIT is a more
sophisticated technologist....BCIT proposes to expand its post diploma training, both in number and in level, up to and including a Bachelor of Technology (BCIT, 1979, p.5).

These findings were endorsed by BCIT’s Engineering Division who reported, “an increasing demand for training in various technologies beyond the Diploma level. This need is particularly true for Surveying, Chemical Analysis, Forest Resource Management, Electrical and Electronics, and Construction Project Management” (p.30). The Health Division concurred reporting “a growing demand for training in specialities beyond the diploma level in fields such as nursing and Bio-Medical Electronics” (p.35). Consequently BCIT’s Five Year Plan submitted to the Ministry in June 1980 included the following educational goal:

The Institute will plan for the development and implementation of Bachelor of Technology degree programs where there are indications of need for such programs (BCIT, 1980a, p.17).

Ministry Task Forces

As mentioned in Chapter Five, two investigative groups — The Task Force to Examine Technological Training in Engineering, Health Science and Related Fields in British Columbia, and the Committee to Examine the Extension of Training at BCIT — were established by the Ministry in 1980. BCIT’s combined submission to these two groups, Vision and Decision, embodies the major thrust for recognition of technological knowledge to baccalaureate level prior to the successful proposal of the 1990s. Vision and Decision argues that as economic and technological trading infrastructures become more complex and sophisticated, technological training structures must reflect this complexity and sophistication (p.41). With reference to baccalaureate education the document restates, and advocates the approval of, the recommendations of the Post Diploma Activities Committee.
The terms of reference of the Task Force to Examine Technological Training in Engineering, Health Science and Related Fields required a report to the Committee to Examine the Extension of Training at BCIT regarding the need for a baccalaureate degree in technological education. The Task Force discussed this issue with every group who presented a brief, concluded that, while a definite need for post diploma training existed in certain technological areas, industry did not perceive a "role for a baccalaureate in technology" and consequently recommended that, "The Ministry of Education not sanction or empower any college or institute to offer a baccalaureate in technology as a credential (ME, 1981b, pp.39,40). While this report clearly recognized the direct relationship between economic prosperity and technological advancement (p.19), and furthermore identified a shortage of technologists in British Columbia, it did not acknowledge a need to make these career paths more attractive, but was content to let them remain as "dead ends." The committee to Examine the Extension of Technological Training Beyond Two Years at BCIT, subsequently reported that it did not:

perceive a need for a baccalaureate of technology in British Columbia at this time. The Committee recommends that arrangements for transfer to university programs should be actively pursued by Academic Council and BCIT (BCIT, 1982, p.12). BCIT's response noted that the committee did not turn down the degree proposal, but did not perceive the need at this time.

The Role of the Health Science Technologies

Vision and Decision was BCIT's submission to the two Ministerial Study Groups at the institutional level. A less prominent but ultimately very significant submission was made by the BCIT Health Science Technologies. This marked the beginning of the leadership role of the Health Science Technologies in what was to be BCIT's "stepping stone" approach towards degree granting status via Advanced Diplomas and collaborative degrees with OLA.
Chapter Six: Bachelor of Technology Degree

The Report of the Task Force on Technological Training in Engineering, Health Science and Other Related Fields, (1981) recommended to the Ministry of Education that BCIT be recognized as the primary centre in British Columbia for the education of health science technologists. At that time entry level to practice was successfully achieved by earning a diploma. However, a vacuum existed in relation to acquiring advanced skills and knowledge (Gillespie, 1983). Such additional training was being acquired through on the job experience.

Responding to provincial manpower and educational needs, the Health Science Division began planning post diploma programs. Design of post diploma programs was based on extensive consultation with educators, employers and employees providing input to curriculum content and overall educational goals. Survey research by Miller et al. (1982) of a stratified random sample of 1002 health science technologists throughout British Columbia produced findings which have influenced the development of subsequent post diploma programs at BCIT and proved to be enabling features in the Bachelor of Technology degree. Specifically, the survey indicated a strong interest across the province and found remarkable consensus in the need for: part time programs to serve working adults; alternative delivery modes to enable province wide access; and, a credential which had merit with their own profession. The credential was labelled the “Advanced Diploma in Health Sciences” and was designed to be offered in part time mode throughout British Columbia. The program design was modular, equivalent in scope and depth to one year’s full time study at BCIT and within specified guidelines, students could tailor their studies to meet individual and specific goals.

BCIT’s quest for baccalaureate status had been rejected by the two Ministerial Study Groups. Nurses and public health inspectors were suggesting a degree as a requirement for entry to practice. Gillespie (1983), therefore, emphasized “the importance of attaining university
credit to facilitate a continuum from diploma to advanced diploma to university degree” (p.71). Consequently, in designing the advanced diploma program it was intended that the advanced diploma be submitted to the universities for block credit (Gillespie, 1983). As discussed in Chapter Four, after a two year negotiating process with the University of British Columbia and the University of Victoria dealing only with the nursing degree resulted in a “no credit” decision, a collaborative Bachelor of Health Sciences degree was successfully formulated with the Open University.

The Park Report

The issue of degree granting status for BCIT was revisited again as part of Park’s investigation of BCIT in 1987, discussed in Chapter Five. Specifically the terms of reference of this task force included, “to assess and recommend on the desirability of giving BCIT degree granting status” (Park, 1987, p.2). BCIT’s submission to Commissioner Park, Economic Development through High Technology, (October 1987), contained two recommendations relevant to BCIT’s pursuit of degree granting status. First, the submission urged a re-examination of degree granting status arguing that virtually every other major country has an alternate applied business/industry orientated degree/diploma system running parallel to the university system, whereas Canada lacks opportunities for applied graduates to progress within their chosen field without having to shift laterally to a more theoretically focused university system. Second, was the recommendation to establish a Centre for Applied Technology with a research mandate at BCIT. As outlined in Chapter Five, arguments for this development focused on economic competitiveness, however political underpinnings were evident. A research mandate would differentiate BCIT from the community colleges and it would provide an environment compatible with established degree granting institutions.
The Park Task Force rejected degree granting status for BCIT on the grounds that:

the establishment of degree programs at BCIT would threaten the fundamental purpose of the institution, which is to produce graduates of two year diploma and post diploma programs (Park, 1987, p.39).

As described in Chapter Five, Park rejected BCIT as the appropriate site for a Centre for Applied Technology but favoured housing such a Centre in a small, new and elite College of Advanced Technology, accessible to only the brightest graduates of diploma programs (Park, 1987, p.36). Park added, “clearly such an institution would be degree granting at least to the baccalaureate level” (p.37).

Government rejected the recommendations of the Park Report. BCIT was made the Centre of Advanced Technology for the province. Moreover Hagen's subsequent announcement in September 1988, of a new “advanced technology” mandate suggested that degree granting status for BCIT may warrant re-examination as the institute evolved to fulfil this new mandate.

**Degree Granting Status: Consensus**

Degree granting status for BCIT was a key issue in the strategic planning process that followed the announcement of the new mandate. In a report to the Board of Governors, the Chairman of the Strategic Planning Committee highlighted two increasingly important issues in BCIT’s strategic planning: growing population centres, for example, the Fraser Valley; and, degree granting. The President concurred and acknowledged that the possibility of BCIT offering degrees had been a contentious issue in the past, re-iterated the need to protect the value of the BCIT diploma, but stressed that the Institute should again explore the
possibility of offering a technological degree. The Board of Governors agreed that degree granting should be addressed in the strategic plan.¹⁰

The context and background for the technology degree initiative was provided in Chapter Four. This was a time of considerable activity in the post-secondary system in British Columbia. The Access for All initiative, unveiled in March 1989 by Hagen, was well underway. Specifically colleges, at Kelowna, Kamloops and Nanaimo, and Emily Carr College of Art and Design were named as future degree granting institutions outside the university sector; a new university, the University of Northern British Columbia, was planned for Prince George; and, expansion of post-secondary opportunities to serve the Fraser Valley were envisaged through a cooperative plan involving Simon Fraser University, Fraser Valley College and Kwantlen College. The Council on Admissions and Transfer was established within the Access for All initiative to promote a “system” approach and facilitate transfer credit.

The urgency of re-examination degree granting reflected BCIT President, John Watson’s concern for BCIT’s viability in an increasingly competitive post-secondary environment. He drew attention to the potential increase in provincial degree granting institutions, especially in the non-university sector, and argued that if BCIT was not included then the viability of the institution would be seriously threatened. Consequently, degree granting status became an integral part of BCIT’s strategic direction and planning process for the 1990s. Specifically, the rebirth of the Bachelor of Technology degree initiative was located within the following strategy in the vision statement of BCIT’s strategic plan:

We need to develop new and renewed credentials to reflect 21st century needs for employers and graduates (BCIT, 1991, p.vi).

The degree initiative was a strategy itself within this broader strategy.
Creating a Market-Driven Degree

A planning process within any institution must take account of the mission and mandate of the institution, its consequent organisational structure, and pertinent history. BCIT's mission and mandate, stated in Chapter Five, indicate that, perhaps more than any other tertiary institution in British Columbia, BCIT is a market driven institution. BCIT's organisational structure, discussed below, facilitates an ongoing interchange of information between the institution and the community it serves. History provides a context for the degree initiative and identifies potential issues and barriers. Additionally, the planning of the Bachelor of Technology degree responded to the competitive environment in which post-secondary institutions vied for scarce resources.

Through Organisational Structure

Considerable agreement exists in the literature on organisational theory regarding the forces and influences which shape organisational structure. Cameron (1984) illustrates a spectrum of influences from the highly mechanistic (low environmental, high managerial influence) to the highly organic population ecology (high environmental, low managerial influence) approach. These classifications are consistent with Morgan (1986) who suggests organisations can be viewed using various metaphors and asserts that more than one metaphor can apply to an organisation at any time. Morgan uses the machine metaphor to illustrate the bureaucratic nature of organisations and that of an organism to portray organisations adapting to their environments. BCIT, as an educational institution mandated to respond to its communities or environments, exhibits a variety of organisational approaches. BCIT tends to be bureaucratic in its internal managerial structure but, as Fullan (1982) points out, bureaucracy inhibits change and its adoption. Burns and Stalker (1961) uncovered a link
between organisational structure and environment. They suggested that successful organisations in relatively stable and certain environments tended to be mechanistic. Conversely, relatively organic organisations tended to be the successful ones when the environment was unstable and uncertain. In this period of rapid technological change, institutions must therefore adopt some form of organismic approach in inter-actions with their environments to monitor change on a continual basis. Consequently, BCIT's overall organisational approach is that of an open system, or organismic, as it responds to its communities' needs. More specifically, given diminishing fiscal resources and increased consumerism in today's competitive environment, a "population ecology" perspective (Morgan 1986) best represents BCIT's inter-action with stakeholder groups.

This perspective underscores the powerful influence of environment on organisational process and structure and is consistent with the view of an organisation as an "open system." Organisations, like organisms which occur in nature, are open to their environment and must achieve an appropriate relationship with the environment if they are to survive. These "open systems" are characterised by a continuous cycle of input, internal transformation (throughput), output, and feedback. Organisations must constantly monitor their environment and self-regulate on the basis of positive and negative feedback. For BCIT this takes place, in part, through its Advisory Committee structure. Organisations, like organisms, depend on an adequate supply of resources for survival. They compete with other organisations in the face of resource scarcity. From the population ecology perspective, success depends on effective demarcation of a resource niche and outperforming competitors. This organisational structure typifies a market driven institution like BCIT.
Through Strategic Planning

The Bachelor of Technology Degree was a strategy formulated to support the goals identified in BCIT's strategic plan *A Strategy for the Nineties*, (1991). Keller (1983) asserts that strategy is based on calculations about markets for services and probable external conditions. Given that the Bachelor of Technology Degree was identified as a strategy, it became necessary to pursue a strategic planning process specific to the degree within the overall institutional strategic planning process. “Strategic” implies an open system approach, where the organization responds to information from the external environment. While strategic planning enjoys various definitions within this concept, BCIT's interpretation in its degree development is captured in the market based approach adopted by Kotler and Murphy (1981): “The process of developing and maintaining a strategic fit between the organization and its changing marketing opportunities” (p. 471).

Kotler and Murphy (1981) assert that if higher educational institutions are to survive in the future then a strong emphasis on planning is essential, and that “strategic” market planning is most appropriate for the future. Keller’s work, *Academic Strategy* (1983), focuses specifically on strategic planning in higher education institutions. Keller concurs with Kotler and Murphy’s market approach and asserts “that” academic strategy making is competitive, recognizing that higher education is subject to economic market conditions and to increasingly strong competition.... this is the most recently added — and least developed — piece to academic strategy thinking” (p.146).

A competitive environment requiring a market approach means that comparative advantage has become a major interest in higher education. Kotler and Murphy (1981) allude to this when discussing the necessity of institutions adopting a positioning strategy to establish a
market niche. They recommend that "a school should pay attention primarily to those strengths where it possesses a differential advantage; that is, it can out perform competitors on that dimension" (p.477). Moran (1991) suggests a similar approach of building on uniqueness when seeking institutional legitimation. BCIT's strategic plan, *A Strategy for the Nineties* (1991), indicates adoption of this philosophy as it advocates building on strengths and designates areas of emphasis. BCIT began to position itself from the vantage point of being the only public institution in the province exclusively committed to technical education. It had an advanced technology mandate and was the only institution in the non-university sector with a research mandate and, as the former Chair of BCIT's Board of Governors reasoned, in order "to get applied research, needed the ability to grant degrees to foster that environment." Moreover, BCIT had an established research centre, The Technology Centre, to facilitate student and faculty research.

The demarcation of a distinct market niche for BCIT's Bachelor of Technology degrees proved to be a key determinant of its acceptance and legitimation by government, the corporate sector and other post-secondary institutions.

**Through a Consultative Process**

The resurgence of BCIT's Bachelor of Technology degree began in October 1990 when the President of BCIT asked the author, as Chair of BCIT's Educational Council, and the Vice President, Education to prepare a Discussion Paper providing a rationale for a technological degree. To formulate this rationale, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was carried out by scanning the internal and external environments. External forces and trends were assessed using information from current provincial, national and international literature, paying particular attention to government policy documents.
Internal strengths and weaknesses were determined by interviewing key people associated with BCIT: Deans; Associate Deans; senior administrators; and, representatives of the three employee unions (Appendix 6A). In addition, three separate retreats held earlier in the year for the Board of Governors, Senior Management and Directors and Associate Deans, to discuss the overall strategic plan of BCIT, provided further environmental analysis. The results of the SWOT analysis are shown in Appendix 6B.

The Discussion Paper, *Technological Degrees at BCIT*, (February 1991), distributed for feedback throughout the post-secondary and corporate sector both provincially and nationally was, itself, essentially an environmental scanning mechanism. Within the Discussion Paper the rationale for degree granting responded to three questions: Is there a need for a technology degree within British Columbia? Why should BCIT be the chosen institution to offer a degree in technology? What type of degree should this be and how should it be structured? A strategic approach, consistent with Kotler and Murphy's market based approach, is implicit in these questions. The first question, one of need, inherently seeks legitimation of technological knowledge in British Columbia by looking outward to the external environment and identifies opportunities and threats. Kotler and Murphy (1981) equate a need with a gap and extrapolate this further to a market niche. The second question looks internally to the strengths and weaknesses of the institution and seeks a rationale for institutional legitimation. Developing a fit between these is the essence of strategic planning. The answer to the third question established a managing strategy, to enable this strategic fit. The model of the Bachelor of Technology degree, its philosophy, structure and content was designed specifically to provide a strategic fit between BCIT and changing market opportunities (Kotler and Murphy, 1981).
Chapter Six: Bachelor of Technology Degree

The Model

The creation of a Bachelor of Technology degree at BCIT was both a political and educational process. The design of the degree model took into account the following factors: the mandate and culture of the institution; the perceived target market and asked, "who are they and what do they want?"; issues and potential barriers; accountability issues; and, the changing needs of the marketplace with respect to curriculum structure. BCIT identified graduates, from two year diploma programs wanting career advancement opportunities, as its target market. Traditionally, diploma graduates have faced frustrations when seeking baccalaureate studies; articulation with the universities is limited with minimal, if any, credit for their diploma courses. These potential candidates, the majority with full time employment, wanted full credit for prior learning and wanted flexible access and delivery methods to address geographic disadvantage and scarcity of time and financial resources.

Clearly, traditional academic models for degree programs do not fit with the mandate and culture of career technical programs. A typical university degree progresses from a broad base of theoretical knowledge to more specialisation, whereas BCIT's Bachelor of Technology degree branches from more specialised to more general studies. Moreover, BCIT's Bachelor of Technology is further distinguished from traditional university degrees in that it is not a continuous degree program, the curriculum is driven by industry needs rather than by academic bias and, it is designed as a career advancement opportunity rather than a job entry credential. It is structured as follows:

**Bachelor of Technology Degree**

- Diploma of Technology
- Two years relevant work experience
- Advanced Technical Specialties (including practicum)
- Management Courses
- Liberal Education Courses
The model for BCIT's Bachelor of Technology degree was designed to be practical and flexible to meet the changing requirements of the workforce. To maximise access opportunities, all degree programs are offered in part time mode, some in compressed time frame and some by distance methods. The model, with the diploma as the first two years of the degree, ensures full credit for previous studies.

The Proposal

The positioning strategy for a proposal advocating a Bachelor of Technology Degree, a new and alternate path to baccalaureate education in British Columbia, relied heavily on input from two sources, feedback from the Discussion Paper and information acquired by visiting well established institutions offering practice-based degrees, the British Polytechnics.

Extending the consultative process, feedback on the Discussion Paper was sought from the following internal and external stakeholders: BCIT staff; Advisory Committees; the corporate sector; industry regulatory bodies; educational institutions both provincially and nationally; and, government. Feedback was received from external stakeholders through focus groups, meetings and by letter. Focus groups were held with alumni. The authors of the paper met with advisory committees, Deans' external committees, and individually with various stakeholders. However, the majority of external feedback was by letter. Internal feedback occurred in several ways. On an institute wide basis, discussion of issues raised in the Discussion Paper took place in an Open Forum held May 1, 1991. More precise feedback on issues was requested periodically in written form by the Vice President, Education usually as a response to definite questions usually asked of the Deans and Associate Deans. Feedback indicated a majority of positive support from all sectors, identified barriers and concerns, and provided insight to external perceptions of the institute. Communication strategies were
essential both at this stage and following the release of the proposal. They proved to be a significant enabling factor in BCIT’s bid for degree granting status and are discussed in Chapter Seven.

In November 1991, the Vice President, Education and the author as Chair of Educational Council visited four British Polytechnic Institutes, one college of higher learning and the Warwick University Manufacturing Group. This was an interesting period in the evolution of the Polytechnics as they were destined to acquire university status the following year. Prior to the visit the Vice President, Education advised the individual institutions of the purpose of the visit and outlined several issues of interest to BCIT (Appendix 6C). These visits provided valuable insight into the possible models and diverse pathways that lead to applied degrees. All polytechnic institutions visited emphasised the importance of a rigorous quality assurance process as their degrees sought legitimacy alongside traditional academic degrees.

The process of discussion, research and on-site visits culminated in BCIT’s *Proposal for a Technology Degree at BCIT*, (May 1992) authored by McArthur and Gillespie. The proposal was approved by the BCIT’s Educational Council on June 4, 1992\(^{14}\) and subsequently by the Board of Governors on June 23, 1992.\(^{15}\) The proposal was then formally submitted to the Ministry of Advanced Education, Training and Technology on July 15, 1992 (Appendix 6D). The proposal was subsequently circulated to other institutions in the post-secondary system on October 16, 1992 (Appendix 6E). An intense period of boundary work followed as BCIT rationalized its practice-based applied degree and sought to demarcate it from traditional university offerings. President John Watson’s letter of October 14, 1992, to the Minister of Advanced Education, Training and Technology (Appendix 6F) provides clear evidence of
this process. In December 1992 the President received a letter from the Ministry indicating support for legislation enabling BCIT to grant degrees.\textsuperscript{16}

**The Implementation Strategy**

Anticipating a successful bid for degree granting status, BCIT began to address issues requiring resolution prior to implementation of degree programs, specifically a quality assurance process, legislation changes and implementation strategies.

A rigorous Quality Assurance process fosters institutional legitimation. The visit to the British Polytechnic Institutes had underscored the need for a demanding quality assurance process as non-traditional degrees sought legitimacy within the post-secondary sector. In September 1992, BCIT began developing an internal degree validation and quality assurance framework using a peer review process. The quality assurance process served three purposes: to judge the educational validity and standards of the program through collective self appraisal; to invite external confidence in BCIT from other post-secondary institutions and government; and, as a mechanism to discharge the institution's accountability to society, by ensuring a quality product and offering degrees only in areas with a demonstrated market need. BCIT's Bachelor of Technology degrees have two overarching criteria, they must be educationally sound and they must meet industry needs. The degree approval process involves validation by internal and external educators, industry representatives and representatives from the Board of Governors. Validation occurs at three levels: the school level, the institute level and by a visiting external panel. The Quality Assurance Process was ratified by the Educational Council and by the Board of Governors in June 1993. The process was communicated to government and post-secondary stakeholders (Appendix 6G). BCIT's quality assurance process reinforced government confidence in BCIT and proved to be a
significant factor in awarding degree granting status. The Ministry later developed and implemented a provincial approval process. This proved to be a lengthy task which contributed to the delay in implementing BCIT’s degrees. A detailed account is given in Chapter Seven. Integration of BCIT’s process with the provincial process is shown in Appendix 6H.

A request from the President of BCIT for changes to the University Act and the Institute of Technology Act enabling BCIT to grant degrees accompanied the submission of the proposal to the Minister of Advanced Education, Training and Technology, and was reiterated in the President’s Letter of October 14, 1992 (Appendix 6F). Internally BCIT’s senior administration drafted suggestions for specifics in the legislative changes. However, such legislative changes became part of a much bigger picture and warranted a provincial review of governance by the Carter Committee on Governance of Colleges and Institutes. Delays due to governance and legislative issues constrained implementing BCIT’s degrees and are discussed in Chapter Seven.

BCIT’s implementation strategies for the Bachelor of Technology degree were outlined in Implementation of a Degree at BCIT (February 12, 1993). Legislative changes were expected in Spring 1993 (BCIT, 1993, p.2) and the document predicted conferring BCIT’s first technology degrees in June 1995 (BCIT, 1993, p.3). Thirteen Technology Degree Programs were to be phased in over a period of four years. The programs identified were Computer Systems Software, Manufacturing, Critical Care Nursing, Environmental Waste, Advanced Nursing Specialties, Advanced Technology Management, Natural Resources, Accounting, Medical Imaging, Geomatics, Environmental Health Electronics, and Biotechnology (BCIT, 1993). In the course of development the titles of some programs changed whereas others
programs were combined under one “umbrella” degree. Both a former President and a former
Vice President, Education acknowledged that two strategies were intended\textsuperscript{18} and proved to be financially attractive to government.\textsuperscript{19} First, in areas where Advanced Diploma programs existed, funding would be reallocated to the degree program and second, BCIT students would acquire Liberal Education courses through an OLA partnership and college transfer arrangements. The implementation plan was deemed “first rate” by government.\textsuperscript{20}

**The Announcement**

BCIT began to anticipate government’s announcement of degree granting status in Spring 1993. Repeatedly over the next year, BCIT’s internal community tried to forecast the announcement by guessing at politically opportune times, for example, the Premier’s Summit on Skills Training and Development held at BCIT, June 1993. By Spring 1994 specific announcement dates were given to BCIT by the Ministry only to be inched forward days at a time. The Bachelor of Technology degree was announced by Premier Mike Harcourt on May 3, 1994 in his news release “Real Skills for the Real World” heralding the Skills Now initiative (Appendix 61). According to John Watson this “marks one of the most important days in BCIT history.” (Appendix 61). The following day the Premier visited BCIT with Dan Miller, Minister of Skills Training and Labour, to further endorse the degree and announce the creation of the British Columbia Labour Force Development Board. Legislation enabling BCIT to offer degrees was enacted January 15, 1995, a further delay of eight months. Individual degrees had to wait for approval of the specific degree by the Degree Program Review Committee (DPRC). This committee met first in June 1995. BCIT’s Bachelor of Technology in Environmental Engineering Technology was the first degree in the province to
pass successfully through this process, making it the first degree in history-conferred in the British Columbia's non-university sector. This degree was recommended by the DPRC for approval by the Minister on December 15, 1995. Ministerial approval followed in February 1996.

Summary

There have been two major initiatives to seek degree granting status for BCIT. Towards the end of the 1970s there was growing recognition by government and educators of the need to provide technological education beyond the two year diploma program. Task forces assessed the technological training needs of the province and possible extension of programs at BCIT beyond the two year diploma level. Moreover, the Ministry and BCIT explored the possibility of BCIT becoming a polytechnic. BCIT lobbied strongly technological education to the baccalaureate level, however, the bid was unsuccessful. In 1990 degree granting authority for BCIT resurfaced as a key factor in the strategic direction of BCIT. A change in institutional mandate coupled with a more favourable political climate and an increasingly competitive post-secondary environment triggered another attempt. A Discussion Paper, circulated throughout the post-secondary system, argued for BCIT as a degree granting institution. Positive feedback resulted in a Proposal for a technology degree being submitted to government the following year. BCIT's Bachelor of Technology degree was announced in May 1994 and the subsequent legislation enabling BCIT to grant degrees was enacted in January 1995. BCIT's first degree, a Bachelor of Technology in Environmental Engineering Technology, was implemented in February 1996.
Footnotes


2 Ibid p.3.

3 Ibid p.5.

4 Faculty Member: Interview, September 26, 1996.

5 Former President of BCIT: Interview, October 1, 1996.

6 Former Vice President, Education, BCIT: Interview, October 7, 1997.

7 Ibid

8 Former Associate Dean of Nursing: Interview, July 25, 1996.

9 Minutes, Board of Governors, October 23, 1990.

10 Ibid.

11 Former Chair of BCIT Board of Governors and alumnus: Interview, September 16, 1996.

12 Letters of Response to the Discussion Paper: Office of Technology Degree Studies, BCIT.

13 Brian Gillespie, Vice President, Education to Deans and Associate Deans: Memo, July 8, 1991.


15 Minutes, Board of Governors, June 23, 1992.

16 Minutes, Board of Governors, December 15, 1992.

17 Brian Gillespie, Vice President, Education to John Watson, President, BCIT: Memo, January 19, 1993.

18 Former President, BCIT: Interview, August 4, 1995.


20 Former Minister: Interview, September 17, 1996.

21 Daniel Birch, Chair DPRC, to Brian Gillespie, President, BCIT: Letter, January 5, 1996.
Chapter Seven:
Factors Influencing the Creation of a Technology Degree at BCIT
This chapter analyses the research findings and discusses both structural and contextual factors which enabled and constrained the creation of a Bachelor of Technology degree at BCIT. The structure of the chapter separates external and internal contributing factors, however the boundary is often blurred, some factors having both external and internal threads.

External Enabling Factors

Changing Needs of the Workplace

During interviews all stakeholder groups mentioned technological change resulting in changing needs of the workplace, and the need for a workforce with relevant skills. However, a rationale for raising technological education to baccalaureate status in British Columbia must be considered within the social context of the province. Over the past two decades, British Columbia has moved from a resource based towards a knowledge based economy. These structural changes, largely the result of globalization, technological change and demographic shift, have resulted in changed labour market conditions with an increased focus on human capital. Technological change, occurring today at an unprecedented and unparalleled rate, has brought new products and processes of increasing sophistication, resulting not only in the changing occupational composition of employment but also the changing skill and qualification requirements within occupations. Most significant is the growth of service sector employment and increasing convergence and sectoral interdependence between goods and services. The Economic Council of Canada Report, *Good Jobs: Bad Jobs* (1990), confirms changing workplace needs as a result of economic restructuring and consequent polarization of labour markets.
An accelerating pace of change, coupled with increased reliance on human capital, have accentuated the role of education and research and development as key determinants of economic growth and prosperity in a global economy (MAETT, 1991a). According to Rubenson and Willms (1993), “educational attainment affects labour market adjustment and facilitates structural change” (p.2), consequently they contend that, “the changing relationship between education and the economy have brought human resource development to centre stage in the public policy debate” (p.2). Comparatively, levels of education have been rising throughout the world, first in Western Europe and North America, then in Japan, Korea and Taiwan and later in India, China and other developing countries. Mass education at the tertiary level is rapidly becoming the norm as countries seek comparative advantage through greater investment in human capital. Technological innovation as the determinant of economic growth has heightened demand for a workforce skilled in the application of knowledge. The SPARK Human Resource Task Force, (1992) emphasises the need for high-quality, job-ready graduates who possess “sound technical, business and communication skills”... and “practical, up-to-date knowledge of the current industry” (p.21). The Economic Council of Canada report, *Prosperity Through Competitiveness*, (1991), points to the challenge of encouraging Canadians to acquire advanced and specialised skills especially in applied science and technology.

Additionally, economic restructuring has stimulated profound changes in the organizational structure of the workplace. Corporate hierarchies are shifting to “flatter” organisational structures, from a bureaucratic to more flexible paradigms, demanding increased knowledge, different and expanded skill sets and attitudes from every employee. Corporate interviewees, in particular, emphasized the need for technologists to have an expanded skill set which included advanced technological knowledge, managerial skills and “employability skills”
(Debling and Behrman, 1996; Conference Board of Canada, 1992). Both *Prosperity Through Competitiveness* (1991) and *Training for What?* (1995) confirm the need for diversified skill sets with specific emphasis on employability and managerial skills.

**Skills Mismatch**

The *Human Resource Development Report* (1992) points out that learning for a knowledge based world of rapid technological change is quite different from education and training for a more traditional economy based on resource extraction and mass production. Most industrial societies currently face shortages of appropriately skilled labour. Decreasing availability of immigrant or migrant labour means that long term growth of the “new industries” in British Columbia is contingent upon an adequate supply of workers from within the province (MAETT, 1991a). However, technological change has been so accelerated that the labour force has not been able to adjust to these new demands and British Columbia, like most industrialized societies, has not yet been able to match these technologies with the necessary investment in human resources (MEST, 1996). The most apparent influence on unemployment levels has been the application of new technologies to the workplace (Rubenson and Willms, 1993; Gallagher et al., 1997). Porter (1991) reported that “Canada’s education and training systems have failed to respond adequately to the challenges posed by the contemporary global economy” (p.89), consequently he adds. “Canada’s workforce is not well equipped for upgrading and change ... shortages exist or are looming in skill and technology related occupations” (p.67). A mismatch of skills prevails, evidenced by an increase in structural unemployment suggesting that increasing numbers of British Columbians do not have the skills required in the modern workplace.

Even while we confront jobless rates of nearly eight percent, the job vacancy rate — jobs that cannot be filled because no one can be found with the right qualifications
— is the highest in nearly 20 years. There are 600,000 job vacancies in an economy with almost one million unemployed.2

The skills mismatch in Canada is estimated to account for between nine and 27 percent of the total unemployment, which means that between 144000 and 432000 Canadians currently without jobs would be productively employed if they had skills appropriate to labour market needs (OLA, 1994).

In other words, this interpretation of economic growth and high unemployment postulates that the crucial bottle neck is, insufficient human resources development both at micro and macro levels (Bengtsson, 1993 p.136).

Strong rhetorical consensus maintains that comparative and competitive advantage is dependent on a skilled workforce. Interviewees suggested, given changing labour markets, a skilled workforce in the new economic environment was one with greater reliance on applied skills. Specifically, BCIT's Dean of the School of Health Sciences contends that in the 1990s “a skilled workforce is not necessarily an academic workforce.”3 Greater reliance on applied skills is evidenced by increasing numbers of university graduates enrolling at BCIT to acquire relevant job skills. (Appendix 7A). British Columbia Labour Market and Training Needs Analysis, (1994), advocates that 58 percent of job opportunities to the year 2001 will be in occupations requiring college, career/technical or vocational training in contrast to 16 percent requiring a university degree, suggesting that “former credentials are becoming less valuable while the possession of up-to-date skills and knowledge is on the rise” (OLA, 1994, p.47). In general agreement, Training for What? (1995) predicts future job growth will be greater in career/technical programs than university programs. Allen (1996), refutes these findings basing his argument on a comparison of previous employment and salary data of college, technical/vocational and university graduates. Allen compares graduates of four year university programs with graduates of two year or less technical/vocational programs.
Although Allen's program groupings do not permit data exclusive to two year Diploma of Technology graduates, his findings have implications for this study. Of significance, Allen shows that overall, university "applied" areas have both the lowest unemployment rate and the highest percentage of jobs directly related to the graduate's education. Additionally, his data indicates that a four year program of study has greater employment potential than a two year program. Based on Allen's criteria, the combination of these findings support: first, the expansion of programs supplying high level applied skills and knowledge as advocated in contemporary federal and provincial policy documents; and second, the contention outlined in the following section, that the two year Diploma of Technology is no longer adequate to provide the advanced, specialised skills and knowledge currently demanded in the labour market, rather a baccalaureate program is desirable.

**Diploma Not Enough**

All stakeholder groups interviewed acknowledged that unprecedented growth of scientific and technological knowledge has resulted in the two year Diploma of Technology being no longer adequate in some areas to give the graduate technologist both the long term depth of expertise to perform adequately in a rapidly advancing technological field, and an expanded skill set is now required by a restructured economy. As the former President of BCIT concedes, "the diploma just won't do it anymore." The *Human Development Project Report* (1992) concurs:

> As we look into the future, it seems clear that the knowledge and skill developed through one and two year applied programs will not remain sufficient to meet the demands of the economy or society for any extended period, (p.42).

While the two year diploma provides a credible job entry credential, continuing emphasis on advanced training is necessary to create a workforce attuned to new technological development. In some areas, advisory committees were suggesting that students "needed
another year to do justice to the material people thought they needed when they were ready to go to work." Provincial documentation such as Partners for the Future (1991) acknowledges the need for a technological workforce with increasing skill requirements.

However, as BCIT's former president pointed out, "if you’re asking students in contemporary society to go to school for three years they want more than a diploma." Interview data suggested that students spending in excess of two years in post-secondary education would demand a recognized advanced credential, a degree. All stakeholder groups noted a general trend by employers to require higher levels of education, using credentials in some cases as a screening device. Both a former Associate Dean of Nursing and a BCIT faculty member pointed to evidence in the increasing demand for degree level education by professional bodies. For example, public health inspectors and certified management accountants, who previously accepted a diploma as entry to practice, are now requiring degrees. These professional bodies do not specify the degree required, suggesting that specific knowledge content is extraneous, rather the credential is being used as a screen. In contrast, the nursing profession anticipates a nursing degree as entry to practice by the year 2000. Extending technological education from the diploma to degree level was seen by some interviewees as a way to motivate and create an educated workforce.

Alternate Path to Baccalaureate Education

Several interviewees, in particular two BCIT Deans, an Associate Dean and a BCIT faculty member, drew attention to other education systems and observed that, unlike many industrialized societies, British Columbia, along with the majority of Canadian provinces, has not offered a valued alternate but parallel path to university education, one with a more practical focus. Smith (1991a) concurs: “the essential characteristic of the United States and Canadian systems is the absence of prestigious alternatives to universities at the post-
secondary level” (p.13). The Human Resource Development Project (1992) reported that, “our workforce is not becoming more skilled at the same rate as the workforce of many other industrialized countries” (p.12). In what may be a consequence, Canada’s competitive ranking among OECD countries declined from 4th place in 1989 to 14th place in 1994. Canada’s educational structure was stated as a contributing factor (World Economic Forum, 1995), because, according to the Dean of the School of Health Sciences, “compared to Europe and Australia, Canada has a very weak polytechnic stream.” Moreover, technical and vocational schools, widely used in many other countries, suffer enrolment problems in Canada, due to a societal perception of “second best.” A former Associate Dean of Nursing agrees:

This country claims not to have stratification, but of course we have stratification, it’s just less obvious....one of the ways we distinguish between people is those who have university education and those who do not., whereas Europe has a philosophy espoused that academic and technical should be equally respected, equally rigorous but with a different focus.

Germany, Japan and Korea, all recognized as having vibrant wealth generating sectors, have education systems which place great emphasis on basic scientific and applied disciplines. Germany has technical universities, Fachhochschulen, and vocational schools; Korea has technical universities and vocational schools; and, Japan has technical colleges. Such institutions provide esteemed alternatives to traditional university training. Practical skills are respected and admired whereas Canadian society seems to denigrate the practical (Smith, 1990). In the United Kingdom the need to encourage technological education and re-education has led to government intervention and legislated reforms:

In higher education, our key reform will be to end the increasingly artificial distinction between the universities on the one hand and the polytechnics and colleges on the other.
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As discussed in Chapter Two, the abolition of the binary system in the United Kingdom in 1992 and the elevation of the polytechnics to university status was intended to address perceptions of hierarchy.

Claim is made that relevant skills would enable British Columbia to compete in a global economy, and individual British Columbians to take their place in a global workforce. Federal and provincial documents identify a need to upgrade the educational system in terms of relevance and responsiveness to changing workplace needs. Agreement with interview data is evident in federal government publications, *Prosperity Through Competitiveness* (1991) and *Learning Well...Living Well* (1991), and in the Premier’s Council Report (1990). All documents acknowledge a technology driven economy and the need for a well educated, skilled and adaptable workforce with an increasing number of people having advanced technological skills.

**Perceived Lack of Balance**

Lack of balance in British Columbia’s post-secondary system was referred to by government and BCIT interviewees as a key driver for baccalaureate recognition of technological education. The creation of university colleges partly addressed the shortfall in undergraduate places and geographic inequalities in academic educational opportunity, but did not adequately address the need for applied studies beyond diploma level. To the contrary, partnerships with universities resulted in increased traditional, discipline-based academic offerings, particularly in the liberal arts and caused further distortion in a system already heavily biased towards academic education. Interview data on imbalance in the system referred both to limited availability of applied programs, and inequality of opportunity within
career/technical programs for smooth transition to higher levels of learning and advanced credentials.

Science and technology drive the economy, yet British Columbia devotes relatively few of its resources to training its population in the application of technology (AECBC, 1992). Consequently, British Columbia faces a critical shortage of graduates in the area of science and technology. In the university sector British Columbia has the lowest student enrolment in Canada in science and engineering, awarding fewer baccalaureate degrees per 1000 population than the rest of Canada in all fields but particularly in mathematics, science and applied science. Compounding this, the proportion of British Columbia college students enrolled in science and technology disciplines is well below that of other regions of Canada (MAETT, 1991a). Historically, British Columbia has relied on a policy of external immigration and within-Canada migration of skilled and educated people to fill job shortages. While this may be a cost effective way of meeting the human resource demands of the province, it also means British Columbia is failing to offer educational programs that lead to relevant and appropriate career options for some of its citizens.

British Columbia is reputed to have a “system” approach to post-secondary education. “The outstanding feature of post-secondary education in B.C. is that it is an organized system: a complex whole composed of connected components” (MET, 1993). The Council of Admissions and Transfer has facilitated movement between colleges and universities for students in academic programs, but trades and technology students have few pathways to advanced studies with appropriate credit transfer; the diploma and certificate credentials have, in many cases, been “dead ends.” Terminal career/technical and vocational programs was identified as a major concern in the Human Resource Development Project Report
(1992) which advocates restructuring of career and vocational programs, so that each program, while having value in itself, serves as a stepping stone to more advanced learning in a related field thus enhancing lifelong career development. Emphasizing a systems approach, the Report adds “this would call for closer working relationships between institutions with different roles” (p.42.)...and concludes that such measures would improve the stature and appeal of career/technical programs and “remove current disincentives to enrolment in these programs” (p.42). This findings concur with those articulated in the report of the Ontario Task Force on Advanced Training, No Dead Ends (1993), which identified two focal points needed for a “system” approach: equal recognition for vocational education; and, cooperation and transferability between institutions. Both BCIT’s President and a BCIT Dean pointed out that laddering opportunities to a Bachelor of Technology degree would provide a “seamless” educational progression for career technical students, similar to that currently enjoyed by students in the academic stream.\textsuperscript{14} There was evident agreement from government interviewees strongly supported applied degrees but recognized that:

> It was beginning to become dysfunctional trying to ladder from our various two year programs into university programs. You start to distort both programs to try make them fit together, when in fact it makes more sense in some circumstances to just design a four year program and you don’t have ladder across and have a different focus.\textsuperscript{15}

And from the university sector where a Vice President, Academic discussing bridging between BCIT and the universities’ programs, reasoned:

> It’s not strange they don’t bridge well, or articulate well. They weren’t set up to articulate so I think in many ways it is a better thing to have the BCIT bachelor’s program continue in a logical way from the two or three year base that is provided already than to try make the articulation into university degrees that are very differently structured.\textsuperscript{16}

Lack of laddering opportunities had both economic and social implications. From a social perspective, educational objectives include the equality of opportunity and social mobility. Growing diversity in student background requires diversity in access routes through higher
education. Many students, especially those from lower socio-economic environments, do not go to university; not because of cost, but because of a preference to move quickly into job opportunities. They tend to enrol in practical programs of short duration, that is career/technical and vocational programs where currently, according to a corporate member of BCIT’s Board of Governors, there is “inequality of opportunity due to poor articulation arrangements.” If such students subsequently develop higher levels of motivation, a clearly articulated pathway from these programs to a Bachelor of Technology degree would enable them to progress. This same interviewee surmised that “the view that courses could be laddered in a way that people could go as far as they want, was a big help to bring this (degree) forward.”

As discussed in Chapter Four, a second phase of the “Access for All” initiative was intended to expand opportunities in career/technical and vocational education. The failure of this initiative, coupled with on going policy debates on educational relevance and how education and training can be best utilized to ensure optimum fit between the needs of the workplace and the knowledge and skills of graduates (BCLFDB, 1995), provided a context for an apparent shift in government policy. Charting A New Course, (1996), indicates a focus on applied programs:

The introduction of new degree programs, and the continuation of existing degree programs, in university colleges and institutes will be consistent with the established mandates of these institutions. Programs with an applied emphasis and a focus on employment opportunities will continue to comprise the majority of new programs” (p.34).

Interviewees confirmed a very deliberate shift in government policy to redress the system imbalance and provide more opportunities in applied studies. This was seen as fostering an enabling environment for the introduction of practice-based technology degrees.
Argument about the lack of balance in the post-secondary system and the need for a more seamless system in career/technical education comparable to that in academic education was made in *Training for What*, (1995) and the *Human Resource Development Project* (1992). Specifically, the *Human Resource Development Project*, (1992) advocated that “as the system expands, particular attention must be given to redressing the imbalance that currently exists in the types of learning opportunity” (p.38). Furthermore, a major focus of the Human Resource Development Project Report was the removal of institutional barriers, and the use of bridging and laddering such that no program is perceived by students to be a dead end.

This concept of a seamless education and training structure, “be it technical, vocational or academic,” was identified as a common integrating theme at the Premier’s Summit on Skills Development and Training (1993). Similarly *No Dead Ends*, the Report of the Task Force on Advanced Training to the Minister of Education and Training, Ontario (1993), advocated a more balanced and seamless system with equal recognition of vocational and academic education, arguing that only through baccalaureate status will this equality be realized. The “Skills Now” (1994) initiative was the operational plan to redress the imbalance and increase the availability of applied skills to British Columbians.

**Career Mobility and Upgrading**

BCIT faculty, administrators, alumni and Board members indicated that pressure from graduates for career mobility and upgrading opportunities to baccalaureate level was a significant enabling factor in the realization of a Bachelor of Technology degree. Diploma graduates, demanding upgrading and career advancement opportunities, have been advocates for a technological degree in British Columbia for almost two decades (Appendix 7B), underscoring the need for an alternate but parallel track to the universities for degree level applied studies as exists in other countries. Attempts to articulate into a British Columbia
university degree program were frustrated in most cases by very limited, if any, credit recognition and moreover, graduates were required to shift their focus to a theoretical university degree. Consequently, diploma graduates had either to leave the province or even the country to advance. For example: chemical science graduates went to Lakehead University, Thunder Bay; business graduates went to Pennsylvania; and, mining graduates went to the Colorado School of Mines, Boulder. A former President of BCIT recalls:

\[ \text{One of my comments to the Dean of Applied Science at UBC was that we (BCIT) were graduating more miners with engineering degrees via the Colorado School of Mines than UBC.} \]

He pointed to a further consequence where graduates, having had to leave the province to advance, did not return but found employment in their location. Their expertise was then lost to British Columbia.

Articulation difficulties resulted in inefficiencies for the individual and the system. Education Council Minutes of September 14, 1987 confirmed articulation difficulties with lower mainland universities and reported that, as a consequence, the Minister, the Honourable Jack Heinrich, had suggested that BCIT apply for degree granting status. Graduate demand for upgrading to a degree credential is documented in the graduate surveys conducted by the School of Health Sciences in 1982 and detailed in Chapter Six, and by the School of Business students in 1989 where graduates were asked to if they would be interested in taking a third year at BCIT. Ninety percent (163) of the respondents said “yes” if it led to a degree.

Graduates surveyed commented that “many employers preferred a degree over a diploma.” Both graduate and student demand for baccalaureate status are reinforced in an exploratory survey conducted in May 1995 by BCIT’s School of Electrical and Electronics to assess the need for a degree in this field. The graduate response rate was 48 percent (384), of which 48 percent of respondents indicated interest in completing the Bachelor of Technology degree.
and a further 35 per cent preferred taking individual courses and maybe completing a degree. The current second year diploma students yielded almost a 100 percent (41) response rate. Eighty-eight percent answered “yes” when asked if they would consider the Bachelor of Technology degree with 81 percent advocating “very strong” support for the program.

The shortage of students opting for science-related and technical fields in British Columbia suggest that these career paths should be made as enticing and valued as possible, both for initial entrants to the workforce and those contemplating retraining opportunities. The Premier’s Council, Ontario, concurs, recognizing the need to provide enhanced and valued career opportunities in technological education:

"technological education and careers must be made more attractive and viable for students" ....... creating advanced level credits in technological studies could enhance their status and substantiate claims of their worth (Premier’s Council, 1991).

Documents and interviews agreed that a degree was the appropriate credential. First, from a societal perspective, Smith (1991b) asserts, “the baccalaureate degree for graduates of combined programs will help improve societal respect for practical, as opposed to theoretical, abilities” (p.1). A former Minister, responsible for post-secondary education in British Columbia, agreed that “it (degree) can dignify technical education and help break down this artificial dichotomy between training and education that is so desperately needed in our system and in the ministry.”22 Society places great value on the degree, its standard is universally recognized. The former Chair, BCIT Board of Governors agrees:

Whether we like it or not society equates a degree with quality. We (BCIT) had quality all along, we spoke of quality, we had the results of quality because of graduates’ success, but we were the poor cousin because we didn’t have the stamp that said it was quality.23
Historically, there has been a strong student demand for degree and academic programs based on entrenched societal attitudes of prestige (BCLFDB, 1995) and confirmed by higher paid jobs for graduates (Allen 1996). As a result of societal and parental pressure, many students with great technical aptitude are initially lost to career technical education. In British Columbia the university transfer track shows the fastest post-secondary enrolment growth, whereas fewer than five percent go directly into career/technical or vocational programs.

Second, from an individual perspective, a degree credential is a motivator. This is particularly significant as we embrace a culture of lifelong learning. Technological and structural change resulting in obsolescence of skills, and demographic shift to an aging workforce means economic prosperity will become increasingly dependent on the extent and quality of education and training provided to the existing workforce. Specifically, in British Columbia 75 percent of those presently working will still be in the workforce 10 years from now (BCLFDB, 1995). Formal study is hard for anyone at any time, but it becomes noticeably harder with age and with increasing financial and societal pressures. For adults contemplating upskilling, the rewards must be sufficiently attractive to sustain motivation. In particular, formal societal recognition of particular levels of educational achievement plays a very important role:

The earning of some particular degree is the goal that keeps most students in school when they are tired or discouraged....There is evidence, on the other hand, that the opportunity to attend classes as non-degree students is far less attractive (Massachusetts Institute of Technology, 1982, p.25).

As one BCIT faculty member notes, "a degree in North America has particular attributes in the public mind that are not attached to any other credential ....in other parts of the world there are different attitudes but we don’t give equal weight to other credentials and qualifications; once we go beyond the diploma, we need a degree to get public acceptance."
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As the globe shrinks and free trade agreements become a reality, mobility of expertise will accelerate. The degree appears to be the globally recognized credential that is portable and meaningful:

The value of practical skills should be endorsed and supported with all the ardor accorded scholarly pursuits; therefore advanced training should lead to a globally recognized credential which is portable and meaningful. The Task Force finds that only the degree credential has these characteristics (MET, 1993, Summary, p.3).

Third, in a time of “credential inflation,” a degree is increasingly used as a screening device both for initial entrants to the workforce and career mobility within the workforce. According to a former Deputy Minister:

What we have today in the labour market is a process of selective rejection....employers are lazy like everybody else and they use the absence of a university degree as rejection. It’s a screening device but it’s not screening in, it’s screening out.25

A BCIT faculty member concedes, “if it’s (degree) used as a screening device, we have to do whatever it takes to get through the screen.”26 To date, career mobility for diploma graduates has been hindered by lack of a degree and further, by articulation difficulties to build on their current knowledge towards a degree. Diploma graduates are readily accepted into the workforce, favoured in some fields over degree graduates, because of their “job ready” skills. Typically after three to five years, given career advancement opportunities to move into higher positions of technical and/or managerial responsibility, diploma graduates often encounter a “glass ceiling”27 and are passed over in favour of degree graduates. A former Associate Dean of Nursing offered specific evidence from the hospitals where qualified nurses with many years of on the job experience are by-passed for promotion by younger and less experienced nurses with baccalaureate degrees.28 Allen (1996) provides evidence of this “ceiling” as he shows salaries of baccalaureate graduates overtaking those of diploma graduates as they reach their early thirties.
Credential-based barriers are identified in both the *Human Resource Development Project* (1992), the Premier's Council Report (1991) and in *No Dead Ends* (1993). Surveys of the Ontario Association of Certified Engineering Technicians and Technologists, and graduates of Colleges of Applied Arts and Technology, reported in *No Dead Ends* (1993), indicated a demand for articulated pathways to a degree credential. Interview data are consistent with the philosophy of lifelong learning espoused by numerous sources in current literature. Demands for a well articulated pathway to degree studies by technology graduates relates directly to government rationale for a seamless system of career/technical education and Ministry concerns of duplication of costs and the social agenda of equality of opportunity.

**Accountability**

Accountability includes both assuring value for public money spent in the learning system, and ensuring that the system operates as an integrated whole (BCLFDB, 1995) to avoid unnecessary duplication. Accountability implies efficiency and effectiveness and, in this study embraces fiscal responsibility and cost effectiveness. Cost effectiveness was a vital enabling factor expressed predominantly by government interviewees but also by senior BCIT administrators. British Columbia, like other jurisdictions, faces debate on the high costs and relevance of higher education. A former Associate Dean recalls an employer asking, "Why are we spending all this money on education?. We still don’t have skilled workers. I mean there’s something wrong here." Our learning system faces a funding crisis prompted by cuts in federal transfer payments. Consequently, as a former Minister responsible for post-secondary education points out, government’s major concern with any new proposal is "is it worth the money?" Contemporary policy documents emphasise cost effectiveness. *Training for What*, (1995) asserts:
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The funding crunch faced by the learning system means B.C. cannot afford the luxury of large numbers of graduates whose qualifications do not match as clearly as they might to the education and skill needs of the labour market (p.24).

Poor integration is resulting in cost duplication and recycling within the system. Societal and parental pressure for degree status, coupled with the graduate needs for relevant job skills for the labour market have resulted in many students pursuing circuitous routes via college and university to technological education. For example, in 1991, of the immediate transfers to BCIT, approximately 23 per cent transferred directly from university, 69 per cent from another college, and only eight per cent from high school (MSTL, 1994). In 1994, 14 per cent of students entering technology programs at BCIT already had university degrees (BCLFDB, 1995). Given that enrolment trends favouring academic degree programs runs counter to projected trends in labour market demands (BCLFDB, 1995), recycling will likely increase within the post-secondary system. Not only is this a costly process for the province and the student but it raises an equity issue where scarce public resources are being over utilized by some students in the system, whereas others are desperately trying to get access (BCLFDB, 1995). These concerns were reflected by government:

I met a student at a BCIT Open House who had a UBC engineering degree and is now training at BCIT. He thinks that’s wonderful, BCIT people think that’s wonderful, I think that’s kinda neat that UBC has been upstaged by BCIT. As Minister of Advanced Education, I think it’s an outrage. I’m being asked to lay out for the public $8,000-$10,000 a year or what ever it is we put into a BCIT FTE for someone for whom we’ve already laid out $40,000 ....the more I think about it the more outraged I become. I’ve got to stop this because we’ve got so many people who are not able to get any post-secondary education.32

Recycling, duplication of effort and costs are also evident as students moving from BCIT to the university sector for degree level studies are denied credit recognition. The model of BCIT’s Bachelor of Technology degree, outlined in Chapter Six and detailed later in this chapter, was designed to provide an efficient, effective and fiscally responsible way of
combining objectives of degree status and relevant work skills, and potentially reducing the recycling of students in the system. The Ministry of Education, Skills and Training’s strategic plan, *Charting a New Course* (1996), cites affordability as one of its four stated goals, and indicates that relevance and quality, access and accountability will be factors in the allocation of resources to institutions.

**Timing**

The phrase, “the time was right,” was heard repeatedly from interviewees representing all stakeholder groups. These individuals agreed that the timing of BCIT’s successful bid to award technology degrees was the key external determinant of success. Contrary to the researcher’s immediate assumption, interview data revealed that the issue of “timing” was political rather than economic, and referred to political aspects of the provincial post-secondary system. Several factors contributed to these events. Most prominent was the change whereby universities no longer had a degree granting monopoly. The break came initially with OLA, then with the creation of university colleges through the Access initiative. Minutes of the BCIT Board of Governors, (June 23 1992) concurred that the “question of the non-university sector granting degrees was an important part of the Ministry agenda ...this would assist BCIT.” Second, both government and BCIT personnel interviewed cited the current political advantage of inclusion of BCIT within a group of institutions designated as degree granting, in contrast to the political situation of the 1980s where BCIT alone had attempted to join the elite group of three university degree granting institutions. At that time the colleges argued against this differentiation and the universities, anticipating competition, were not supportive. In the 1990s, however, as a former Vice President, Education points out, “the tables were turned.”\(^{33}\) Selected colleges were to be elevated to autonomous degree granting institutions and, in the opinion of interviewees, it would have been politically...
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indefensible to exclude BCIT, the only provincial technological institution. Third, interview data suggested “the time was right” from the perspective of both institutional age and maturity, and time required for “people to distil and accept a new idea.” 34 BCIT had first advocated granting degrees in the early 1980s and, as a former Associate Dean observed:

it takes ten years of people enunciating, articulating, investing, putting forward ...if it’s a significant change you can count on ten years before there starts to be the emergence of the change that’s advocated. But it has to have many points of view, it has to have many different kinds of people, it has to have many different levels of society before there will be the political will to actually allow a significant innovation. 35

These opinions reinforce Moran’s (1991) thesis that institutional age is a determinant of legitimacy. In the opinion of the Dean of the School of Health Sciences, it was “not so much that BCIT’s focus changed but that the external environment changed to say what BCIT has to offer is strategically very well placed given where the province needed to go.” 36

Internal Enabling Factors

Institutional credibility and stature are earned by performance within the culture (Moran 1991). As the provincial technical institution, BCIT derives its culture from both the post-secondary environment in which it is situated and the industry sector it is mandated to serve. Credibility and stature are the result of the confidence of the external community in the institution and may be attributed to, for example, the success of its programs, the graduates it produces, its leadership.

Leadership

Legitimation by the state is crucial to the survival and evolution of an institution. Moran (1991) asserts that government officials’ perceptions of the comparative worth or ‘relevance’
of fields of knowledge and their role in fulfilling state economic and social agendas, affect decisions on institutional mandates. This current study reveals that government confidence in institutional leadership was a critical determinant in legitimation. Convergence and validation of these two dimensions of legitimation was expressed by a former Deputy Minister when discussing the Bachelor of Technology degree:

"If I could put the genesis in perspective ... government responded to institutional leadership and the institutional leadership tapped into something that was considered desirable to do." 37

Interview data from all stakeholder groups indicated that the institutional leadership was the pivotal factor in BCIT's successful bid for degree granting status. Government confidence was evident:

"We were very pleased with the strength of the leadership at BCIT and there was a very, very high level of respect for the President and the Vice President of Academics (sic)." 38

The appointment of John Watson as President of BCIT in 1989 marked a turning point in BCIT’s relationship with government. Government interviewees, having worked with BCIT’s president in his previous appointment as Assistant Deputy Minister, emphasized their confidence in his credibility and vision. "John had a tremendous amount of credibility with me and my colleagues" 39 and "was very highly regarded in government." 40 Watson was an excellent communicator and his experience in government had given him a solid understanding of how the system worked. 41 Additionally, interview data suggested that the president’s working knowledge of government facilitated the movement of the proposal through the system. In contrast to earlier times, government now regarded the president and his new leadership team collectively, as "positive, supportive and visionary." 42 Internal agreement was evident. A BCIT Dean agreed, "we had a V.P. with a clear vision of where he wanted to take BCIT and a Board that was supportive." 43
Premier’s Summit on Skills Development and Training held at BCIT in June 1993, Premier Mike Harcourt emphasised the “need to put higher value on creative and visionary leadership” (MSTL, 1993 p. 92). Faculty responded to a more open style of leadership, were aware of increased government confidence in Watson as a leader and consequently, were more supportive of what he proposed. As one faculty member remarked, “I don’t think it is a coincidence that these things happened when he was President.” Internal community interviewees reflected government’s confidence in the leadership and attributed a more stable and supportive campus environment to this change in leadership. Specifically, the president’s communication strategies had fostered a collaborative working relationship with all stakeholders. Communication strategies proved integral to the success of the degree initiative and will be discussed later in this chapter.

Issues of the 1990’s predicts “strong, insightful and perceptive” (p. 2) educational leadership as a critical issue for the 1990’s, primarily because of the turbulent period of change. Interview data from all stakeholder groups indicated greater confidence and vision at all levels of leadership. Government, corporate and internal interviewees described the Board of Governors as stable, supportive of the institution and wanting to see it progress. External and internal interviewees alluded to leadership at the faculty level: a Vice President, Academic from the university sector acknowledged that faculty had the respect of their peers; the corporate sector interviewees described BCIT faculty as competent, energetic and with a strong belief in what they do; and, a BCIT faculty interviewee acknowledged that the faculty championing degree programs were responsible and highly respected within the institution. Forces of Change Influencing Education and Training (1991) encapsulates opinions of all interviewees:

“A leadership that has long term vision and is able to develop a consensus of the various constituencies is absolutely vital” (p. 53).
Institutional Reputation

BCIT’s proven reputation in technological education, based on the success of diploma graduates, was a key determinant mentioned by all interviewees. A former Deputy Minister notes that “the image factor of BCIT is very, very positive in the B.C. market place.” A survey conducted of members of the Canadian Federation of Independent Business, asking employers to rate the effectiveness of different kinds of training, indicated patterns in British Columbia which differ from elsewhere, in that technology graduates were well received, whereas this was not the case in other parts of Canada. Since it opened in the 1960s, BCIT has achieved national and international recognition, its current programs are held in high esteem by business and industry as evidenced by the high placement rate of BCIT graduates. As one corporate interviewee acknowledged, “the diploma itself is well recognized and has got a huge reputation in the business community.” Interview data suggest that corporate interviewees based reputation on the product, the abilities and success of diploma graduates, and saw the move to degrees as a rational progression to a higher end product. From the perspective of employee recruitment and consequent investment, one member of the corporate sector judged a degree offered by BCIT as an advanced version of a proven product from a proven supplier:

It’s like why would you go out and buy an Accura? Well one of the reasons is that you had a Honda and you know the reputation of Honda and now you can get an upscale version i.e. it has reputation at the low end.

The high placement details of BCIT graduates documented in BCIT’s annual Placement Book: Survey of Graduates reflects institutional reputation. For example, the Survey of 1995 Graduates gives the length of time for graduates to find their current employment as follows: 17 percent before finishing their BCIT program; 63 percent within two months after graduation; and, 19 percent two months after graduation (Institutional Research and Planning, BCIT, June 1997).
Government interviewees based institutional reputation on both accountable processes and proven product. For example, two government interviewees acknowledged that BCIT's rigorous quality assurance process for degree validation was a significant enabling factor promoting external confidence in degree granting status for BCIT.53 Forces of Change Influencing Education, (1991) endorses quality measures through “rich mechanisms of peer review and institutional evaluation” (p.47), whereas the Human Resource Development Project Report, (1992) stresses public accountability through “valid methods of measurement” (p.52). A former Director of Universities and Provincial Institutes suggested that “the quality or how the degree would be perceived has a lot more to do with political processes than it does with content,”54 indicating that enabling close involvement of employers in all programs through a strong advisory committee structure had built the reputation and aura around the BCIT graduate. All stakeholder groups acknowledged BCIT's advisory committee structure as a key factor in institutional confidence and reputation, and that political processes of closely involving employers in all programs played a significant role in the perception of a BCIT degree. The importance of collaboration with industry in program development is echoed in contemporary policy documents such as Partners for the Future, (1991), the Human Resource Development Project Report, (1992) and Training for What, (1995). The willingness of industry to partner in program development is reflected in the School of Electrical and Electronics Industry Survey, May 1995 where 21 out of 25 (84%) firms surveyed expressed a desire to actively participate in the development of a Bachelor of Technology degree.

Supportive Internal Community

Interviewees recognized a supportive internal community as providing an enabling context. Internal interviewees attributed this to a collaborative approach and one which did not
threaten job security.\textsuperscript{55} In contrast to the 1980s, when faculty were actively opposed to the introduction of degrees, in the 1990s faculty appeared to be supportive or neutral. As one faculty member remarked:

I don't hear any opposition to it and the way it's being done in a sort of pilot where there are obvious needs. It's being done by very responsible faculty people. It's not something that is being thrust on faculty by the administration but is being done by faculty and in consultation with faculty because the smart people we have leading these degree programs are well known and respected within the institute and that makes a lot of difference.\textsuperscript{56}

This attitudinal change may be attributed in part to communication strategies, discussed in a later section, however a more significant factor was recognition by faculty of the demand for higher levels of education in the workplace coupled with a more competitive post-secondary environment. A faculty member, noting the advent of university colleges and a new university, cautioned, "faculty could see the writing on the wall....BCIT couldn't afford to be left behind... we can't afford to stay with our two year programs, we have to be prepared to change."\textsuperscript{57} The presence of a respected Education Council was seen as a vehicle for faculty to play an active role in the planning process.\textsuperscript{58} External interviewees identified the drive and determination of a faculty, proud of what they do, as a significant key factor.\textsuperscript{59} The \textit{Human Resource Development Project Report}, (1992) supports interview data on three counts: that faculty need reassurance that being responsive to change will not put their careers at risk; that faculty must be visibly engaged in the planning process; and, that change is best accommodated when faculty recognize they are a valued part of the planning process and not subject to arbitrary institutional or government action. Support from the internal community is attributed largely to improved communication strategies and increased confidence in the institutional leadership. It is discussed further in these respective sections.
Chapter 7: Factors Influencing the Creation of a Technology Degree at BCIT

"Stepping Stone" Approach

BCIT was already offering degree level courses, using a somewhat circumspect approach. The survey research by Miller et al. (1982), identifying the need for post diploma studies, resulted in BCIT offering an integrated program of advanced technical specialty courses culminating in an Advanced Diploma credential. As described in Chapter Four, when BCIT partnered with the Open Learning Agency to offer collaborative degrees, advanced diploma courses were formally validated as baccalaureate level courses by the Academic Council of OLA and incorporated into the joint BCIT/OLA degree. Minutes of meetings of the BCIT Board of Governors and Education Council report on the establishment of individual Advanced Diploma programs and the progress and outcomes of BCIT’s negotiations with OLA in the preparation of each collaborative degree. All interviewees agreed that the stepping stone approach to degree granting adopted by BCIT was a critical enabling factor. Rationalizing this cautious approach, BCIT’s former president noted that “no one gets excited when you award an Advanced Diploma; it’s only when you mention the word degree.” This stepping stone approach both established and tested an infrastructure which facilitated a natural evolution towards BCIT’s own degree granting mandate. Furthermore it delineated a market niche for BCIT.

Infrastructure

Government interviewees saw this stepping stone approach as significant on three counts. Economically, high enrolment in these programs demonstrated relevance to labour market needs and upgrading opportunities. Pedagogically, it validated an innovative model of flexible delivery in terms of time, format and location while addressing social issues of access. Advanced diploma courses were offered in part time mode and, in many cases, by
distance education. BCIT had demonstrated expertise in flexible delivery modes. Since its inception thirty years ago, BCIT's Extension Division has provided credit courses, enabling students to work towards a recognized credential on a part time basis and through distance methods. Third, and perhaps most importantly, there was an established cost structure. Funding could be transferred from Advanced Diploma programs, enabling BCIT to offer degrees at only incremental cost to government.63

The tenor of internal interviews, however, was "it proved we could do the job." The stepping stone approach demonstrated the content and rigour of expertise of BCIT's advanced level courses warranted baccalaureate recognition. As the former Chair of BCIT's Board of Governors pointed out, "we were giving degree level studies, we just couldn't put degree at the end of the name."64

Furthermore, a latent function of the stepping stone approach was to prepare stakeholder groups for BCIT's own degree granting mandate. BCIT faculty without higher level credentials, who were involved in collaborative degree programs with OLA, were required to upgrade their credentials within a five year period. New faculty hired were required to have a magistral or doctoral degree. Consequently, in terms of faculty, the infrastructure was in place for BCIT's move to degree granting status. Interview data suggested that this progressive approach had created a sense of preparedness, acceptance and almost inevitability within the faculty.65 Similarly, advisory committee and industry acceptance of BCIT degrees were in place. The approach via Advanced Diplomas had enabled BCIT to work in consultation with individual advisory committees and build on to the diploma in those areas where a market demand existed for advanced knowledge. Understanding the incorporation of the Advanced Diploma into Bachelor of Technology degree structure gave industry
confidence that this was a natural progression which would enhance rather than detract from the diploma.\textsuperscript{66} The Executive Director of the Applied Scientists, Technologists and Technicians of British Columbia asserts that the stepping stone approach to degree granting served as:

\begin{quote}
\vspace{1em}
\noindent a vehicle to demonstrate to the “powers that be” that this is a good thing, that there’s a market for it; there’s a need for it; and it demonstrates through testimonials, the enhanced skills of graduates who have gone through the process.\textsuperscript{67}
\end{quote}

The Dean of the School of Engineering Technology agreed that, “without taking care of the infrastructure we would not have been nearly as successful with the degree initiative.”\textsuperscript{68}

**Market Niche**

Interviews with BCIT personnel suggested that the stepping stone approach had provided a further opportunity. It served to delineate clearly BCIT’s intended market niche in advanced studies, thereby inviting confidence and support from both the universities and government. Deliberate choice of collaborative degree programs with OLA demarcated program areas peripheral to what is regarded as university territory. The School of Health Sciences focused on specialty nursing rather than general nursing degrees, the School of Engineering Technology offered hybrid degrees, for example both the Computer Systems and Technology Management degrees were combinations of business and technical qualifications; such combinations had strong support in particular industry sectors.\textsuperscript{69} The “political” aspect of choice was evident when BCIT offered its first Engineering Technology degree under its own mandate. The Bachelor of Technology in Environmental Engineering Technology represented a new field that was neither offered by the universities nor yet categorized by the Society of Professional Engineers. Therefore, according to the Dean of the School of Engineering Technology, BCIT established a niche in the engineering market without encountering retaliation. BCIT’s market niche was further delineated by identifying its target market as
diploma graduates — working adults seeking career advancement — rather than the eighteen to twenty four year old cohort traditionally served by the universities. Working adults require innovative and flexible access to degree level studies; BCIT had a demonstrated expertise in both part time studies and distance education.

Keller (1983) recommends that institutions look at what position they already own, rather than what they are, in order to position themselves strategically. Strategic positioning is inextricably linked to comparative advantage, that is where an institution can out perform its competitors. Cyert endorses this perspective and clearly reflects BCIT’s demarcation strategies:

The planning unit must determine what its comparative advantages are. Comparative advantage means comparative to other departments, colleges or universities with which that unit is competing. We must face the fact that colleges and universities are in a competitive market. Comparative advantage may stem from a location. It may be based in particular strengths in the organization that have developed over the years, or it may be based on a particular person or group of persons who have flourished at the institute. It may be based on historical traditions of the organization. The point is that there are some elements which the school can build on to create an organization that has, if not unique characteristics, special characteristics that only a few can match. The aim of strategic planning is to place the unit in a distinctive position.\(^{70}\)

BCIT had established a distinct market niche at the diploma level and sought legitimation by building on what it already owned. As the only institution in the province totally committed to technological education, a technology degree focused on producing graduates with theoretical knowledge and practical competencies for the workplace marked a natural progression and extension of BCIT’s mandate. As one corporate interviewee noted, “in our society progression is an upgrading of what you offer — having a higher end product.”\(^{71}\) The Client Survey Project, (1992) indicated that while students entering post-secondary studies have a number of different expectations, career/financial, educational, social and personal,
these expectations are consistently highest for their career/financial aspirations. In contrast, the content of undergraduate degrees at universities have been increasingly driven by the criteria for admission to graduate school with the perverse result that the majority of students took programs that prepared them for things they were not going to do and were unable to take programs for what they were going to do. By combining practical skills with academic rigour, a BCIT degree filled a different market niche from existing degrees.

BCIT’s program profile, unique in some areas, further defined BCIT’s market niche. Designated the provincial centre for post basic nursing specialties in 1985, BCIT was the only source of nurses in many specialties. Existing nursing baccalaureate programs did not produce graduates to fill specialist clinical positions. Such graduates had to seek further specialist training at BCIT. In the area of Environmental Health, BCIT was the only training centre in Western Canada for Public Health Inspectors. Pressure from this profession was towards a degree for job entry. Advanced Studies in Medical Imaging are available in other countries but BCIT offered the only advanced Medical Imaging program in Canada (McArthur & Gillespie, 1991).

BCIT personnel were clear that the route to degrees via the Advanced Diplomas demarcated BCIT’s market niche and allayed potential “turf” concerns of the universities. However, a Vice President, Academic from the university sector indicated that universities always had a clear vision that BCIT had its distinct market niche and furthermore, because of this distinctiveness, had always taken the position that BCIT grant its own degrees rather than in conjunction with a university.
Overall, the boundary work promoting the Bachelor of Technology degree emphasized a clear process of demarcation from university degrees. Arguments supporting the distinctness of this boundary were related to: the practice-based applied nature; the attachment and connectedness to the workplace via curriculum; and, the distinctive model which builds on to the diploma. Moreover, the titles of Bachelor of Technology degrees relate to occupational categories rather academic clusters, acknowledging their workplace focus and distinction from traditional degrees.

The Model

The model of the Bachelor of Technology Degree was cited as an enabling factor by all interviewees, albeit different stakeholder groups emphasized different components. The model was seen as responding to changing external structures. Interviewees identified two major components of the model: structure and curriculum. Moreover, data relating to the structure of the Bachelor of Technology degree formed three sub-sections: relationship to the diploma; delivery mode; and, accountability measures.

Structure

Relationship to the Diploma

Interview data from all groups endorsed the structure of the degree, primarily because it built on and protected the diploma program, so that BCIT retained its focus and mandate. This supports Moran’s (1991) thesis that building on institutional uniqueness and strengths is an appropriate route to legitimacy. In planning the Bachelor of Technology degree, the major issue to be addressed was a restatement of concerns expressed in the 1980s, both by internal and external stakeholder groups, that the development of the degree might lead to the demise
of the diploma program. The concerns focused on the events at Ryerson and that the loss of the diploma program would be a departure from BCIT’s mission. While one corporate interviewee expressed “concern that BCIT not detract from the diploma,” he was confident that “if BCIT can provide the same kind of focus, emphasis and practicality to the degree level, then I think we have a real winner here.”

The argument was that establishing the diploma as the first two years of the degree program would have a positive impact on, and would encourage enrolment into the diploma program. The diploma becomes a unique motivator, no other degree program rewards its candidates at the halfway mark with a highly esteemed job ready credential. At this point students may enter the workforce with marketable skills, assuring a supply of diploma graduates to meet market and stakeholder demands. The Bachelor of Technology degree, therefore, is more aptly described as a degree completion program in that it builds on the diploma. This structure not only enables full credit for prior learning, but it allays stakeholder concerns that the degree may lead to the demise of the Diploma. The mandatory work experience component, prior to the advanced courses, was intended to reinforce the practical focus but also to provide a break in the program giving added protection to the diploma program. Reflecting the view held by stakeholders from all sectors, one faculty member claims:

The model has led to the acceptance of the degree because there’s still going to be a choice for people...if we were proposing entry level degrees, I think there would be a negative reaction from our community.

The need to retain the diploma is well documented in the investigative Task Force Reports of the early 1980s cited in Chapter Six; the Park Report (1987) and BCIT’s strategic plan, Strategies for the Nineties (1991). Moreover, a model providing an exit point after two years with a recognized credential was validated by comparison with the experience of the British Polytechnics. Participant observation as Chair of BCIT’s Education Council in discussions with polytechnic representatives in the United Kingdom in 1991, revealed that polytechnics
had found it necessary to "back-track" from their original structure of continuous four year degree programs to one where students could exit after two years with a Higher National Diploma credential.

**Delivery Mode**

Government interviewees specifically embraced the delivery system of part time studies and distance education as being innovative, flexible, enabling access to people with geographic and time constraints and consequently supporting economic and social agendas. BCIT’s message “the way that we will deliver these in the part time delivery mode is designed to maximize their contribution to the economic development of this province”\(^76\) “certainly rang the right bells with the ministry.”\(^77\) As lifelong learning becomes part of our culture, part time study has become a personal, social and economic reality (BCLFDB, 1992).

Specifically, *Training for What?*, (1995) recognizes that “most existing workers do not have the financial resources to take full time programs and employers can’t afford to release them” (p.8). Strong agreement was evident from BCIT advisory committees. Participant observation in these meetings revealed that the part-time delivery mode was a key factor in the endorsement of degree programs by employers, who, while wanting their employees to upgrade, were anxious not to deplete their workforce. Corporate interviewees echoed this rationale and sanctioned the model in part because it precluded employees leaving the workforce in order to upgrade. Consistent with *Training for What?*, (1995) this was regarded as both a corporate and individual necessity. Surveys of School of Health Sciences graduates (1982) and School of Business graduates (1987) identified graduate demand for part-time opportunities. Responses from the School of Electrical and Electronics survey (1995) indicated part-time studies, specifically week-day evenings, as the preferred mode of delivery for 86 percent of graduates and 83 per cent of current diploma students. The need for flexible

**Accountability Measures**

External enabling factors discussed previously pressed for more attention be given to accountability measures within the post-secondary system. Government and BCIT interviewees noted that the model of the Bachelor of Technology degree responded to concerns of accountability in the following ways: it demonstrated fiscal responsibility; it enabled integration within the post-secondary system; and, it embodied a process to ensure the standards and rigour of the degree.

The degree model demonstrated fiscal responsibility in three ways. First, BCIT would only offer degree completion programs in programs where there is a demonstrated market need. Second, students would take the liberal education courses through B.C. colleges and universities thus using existing resources and optimizing access for all students in the
province. Furthermore, this approach demonstrated accountability from a quality perspective. It precluded BCIT from criticism of change of focus, offering courses in areas where the institute had no proven expertise and clearly demarcated BCIT’s intended role in baccalaureate education. BCIT’s former President rationalised:

I felt that we shouldn’t try to offer the academic courses ourselves because that’s an area where the universities could express an opinion. They can’t express any opinion about electronic technology, they have nobody who is competent to do so. So we do that part. We do it to the standards that we satisfy ourselves are appropriate. They do the academic, the liberal arts, etc. to a standard they think is appropriate. There is no argument at that point.\textsuperscript{79}

Third, and most importantly, all BCIT senior administrators and government personnel interviewed cited the re-allocation of funds from currently established and funded Advanced Diploma programs to the corresponding degree program as a vital factor. The former President recalls sitting down with the former Vice President, Education with the objective of implementing degrees programs without requiring major new costs.

What we did is we looked at the intensity of the Advanced Diploma and realized we could lower that intensity by spreading those hours over two years. That gave us some room to introduce some liberal studies and it also gave us some room to start shifting the emphasis from the kind of team approach that we used in the diploma to the more individual study approach that we need to be working at the degree level. That’s where we didn’t end up spending any money because we had the hours already paid for, we just repackaged them...We made them (Ministry) an economic offer they couldn’t refuse; the price to them was essentially zero.\textsuperscript{80}

The Advanced Diploma courses were to be incorporated as an advanced technical component of the degree. Consequently, as the current President (former Vice President, Education) pointed out, there were no large capital costs nor did BCIT go into new fields of study incurring significant library costs.\textsuperscript{81} This enabled BCIT to offer degrees at very little incremental cost, which was, according to BCIT’s former President, “a point that went down very well with the Ministry.”\textsuperscript{82} Utilizing Advanced Diploma funds “was a big factor for the
Chapter 7: Factors Influencing the Creation of a Technology Degree at BCIT

Minister"⁸³ former Minister, and “made the decision easier,⁸⁴ as government deliberated degree granting status for BCIT.

Accountability fosters an integrated system. All stakeholder groups cited the integrative aspects of the model: laddering opportunities to advanced studies for career/technical diploma graduates and degree graduates from other institutions students without duplication of studies; the concept of a seamless system; and, the philosophy of lifelong learning. Specifically, the model of the Bachelor of Technology degree mirrored the seamless approach promoted by the Human Resource Development Project Report (1992). The report championed recognition of college or institute graduation as the completion of the first stage of a degree program in a field of applied studies, and further advocated that “such degree programs — especially in non-traditional formats — would have broad appeal to college graduates, typically on a part-time basis, particularly after a period of time in the workforce” (p.42). A well articulated system, within career/technical education, laddering from diploma programs to degrees with full credit is fundamental both to the Human Resources Development Project Report (1992) and to the report No Dead Ends (1993). Both reports promoted a seamless system for career/technical and vocational education within the context of lifelong learning. Lifelong learning, specifically, was identified as a major theme at the Premier’s Summit on Skills Development and Training (1993). For Rubenson and Willms (1993), “the development of a life long learning culture is seen as a cornerstone of economic progress” (p.1). No Dead Ends, (1993) identified three themes running through the relevant reports on education and training in Canada produced by provincial and federal governments over the previous decade, partnerships, life-long learning, and a system of higher learning which includes equal recognition of employment-related learning. The structure of BCIT’s Bachelor of Technology degree incorporated these philosophies.
Accountability includes some measure of quality of one's product. The leadership at BCIT anticipated that the standards and rigour of the non-traditional degrees offered by BCIT would come under intense scrutiny from the universities. Keller (1983) stresses the importance of quality for academic survival in a competitive environment. The experience of the British Polytechnics, as they sought recognition as autonomous degree granting institutions, confirms Keller's assertions and underscored the importance of a rigorous quality assurance process as their degrees sought legitimacy alongside traditional academic degrees. BCIT implemented stringent Quality Assurance and Quality Control procedures involving both external and internal validation of its degree programs. This process well received by the Ministry. Letters of response from the former Director, Universities and Provincial Institutes, and the Assistant Deputy Minister (Appendix 7C), subsequent interviews with these officials, and interviews with two BCIT presidents confirmed that BCIT’s process for ensuring the standard of degrees, demonstrated readiness and gave external confidence in BCIT as a degree granting institution. The issue of Quality Assurance and validation of degrees became a provincial issue. On-going delays in establishing an appropriate provincial process proved to be a significant constraint on the implementation of BCIT degrees and will be discussed in a later section.

**Curriculum**

BCIT’s Bachelor of Technology degree curriculum was designed to address changing labour market demands in the new economy. The need for educational programs to respond to changing technological, economic and social changes is well documented in the educational literature. Dewey (1915) links theory and practice when he writes about industry and educational readjustment:
The chief effort of all educational reforms is to bring about a readjustment of existing scholastic institutions and methods so that they shall respond to changes in general social and intellectual conditions. The school, like any other human institution, acquires inertia and tends to go on doing the things that have once got started, irrespective of present demands (p. 167).

Several decades later, the same criticisms are levelled. Dertouzos et al., (1989) assert:

Without major changes in the ways schools and firms train workers over the course of a life time, no amount of macro economic fine tuning will be able to produce significantly improved economic performance and a rising standard of living (p. 81).

When an educational institution is mandated to be responsive to the needs of business and industry and continual technological change, some form of needs assessment becomes a critical component for program development. Sork (1995) asserts that while “need” and “needs assessment” are widely used concepts in higher education their meanings lack precision. After discussing the many interpretations of the term “need,” Sork suggests a definition of “educational need,” based on human capabilities, which is what education is designed to affect. He defines educational need in a general sense as “a gap or discrepancy between present and desired capability.” If Sork’s definition is applied to technology graduates, “present” capability represent the capabilities of diploma graduates with specialized but narrowly focused education. Economic restructuring, favouring service sector growth and the re-organization of work place structures, have resulted in a “desired” capability by employers of a much broader skill set and a demand for adaptable employees.

BCIT’s Bachelor of Technology degree model was structured to provide this expanded skill set in the third and fourth years of the degree. Compared with a university degree, the Bachelor of Technology model appears “upside- down.” Traditionally, university students begin their studies with a wide range of subjects progressing to more specialized study each year, whereas the technology degree model requires a specialist technical focus in the first two years to ensure technical competence at the diploma level and a broadening of
knowledge through liberal and managerial studies as a capstone to the degree. Additionally, the Bachelor of Technology degree differs from a university degree in that it is an outcomes based degree and, as a Vice President, Academic from the university sector revealed, "universities don't deal with outcomes based degrees." Moreover, the degree is tied to the workplace; the curriculum is driven by market needs and fashioned collaboratively with industry input. Involvement of employers and community in the design of learning systems concurs with recommendations of the Human Resource Development Project. Designed predominantly as a career enhancement opportunity for diploma graduates, the curriculum of the Bachelor of Technology degree responds to employer need for both "sophistication of technical expertise" and new skill sets to accommodate a changing workplace (Gallager et al., 1997). The curriculum includes three distinct categories: advanced technical specialty courses with an industry based practicum, management studies and liberal studies. Corporate interviewees specifically, endorsed the curriculum components of the degree.

**Components**

The advanced technical specialty courses promote currency in a given field consistent with the philosophy of lifelong learning. Interviewees from all stakeholder groups emphasised rapid technological change and on going curriculum adjustment to meet professional upgrading needs. According to one corporate interviewee "technology has become more and more complex and there's more and more to learn." The SPARK Human Resource Task Force Report, (1992), indicates the need for continuous upgrading for even the most highly skilled workers in our knowledge-based industries. BCIT's President points out that the industry based practicum, where students are involved in applied research dealing with a real world industry problem, demarcates a direct relationship between the Bachelor of Technology degree and the economic development of the province. According to the
SPARK Report (1992), "students who don’t have experiential learning will fall far behind those who do" (p.23). Industry/education partnerships, exemplified in the industry-based student practicum, are championed extensively in current literature and policy documents. Porter (1989) refers to the close connection between education institutions and employers in countries with wealth generating economies, for example Germany and Japan. The Report of the Premier’s Summit on Skills and Development (1993) identified renewed emphasis on partnerships in skills and training as one of the six major themes coming out of discussions. Issues of the 1990s (1991) advocates increased synergy between the education and employer–community to develop an effective learning system and support technology transfer.

"Post-industrial labour markets require and favour people with more general education as well as more advanced work skills" (Gallagher et al., 1997, p.13). The SPARK Report, (1992) contends that "not only do employees need a broad range of skills, but they need them in the right combination. Sound technical knowledge and astute business skills and good communication are critical" (p.13). Industry stakeholders surveyed by BCIT’s School of Electrical and Electronics (1995) agreed. For them the immediate benefit of a Bachelor of Technology degree was technical in nature, whereas "the long term benefit would come from the breadth and management skills that could lead to career advancement later" (BCIT, 1997, p.15). Service sector growth in particular, indicates greater reliance on interpersonal and communication skills. Management and liberal studies respond to an expanded skill set needed as a result of organizational restructuring in a new economic order. Corporate interviewees deemed management and liberal studies as essential to broaden the technologists’ perspective and enhance employability skills. For Debling and Behrman (1996), "employability skills' is a generic term used to describe the wide range of skills and personal qualities that are sought in new recruits at all levels by employers in both the public
and private sectors" (p.1). An Employability Skills Profile resulting from a survey by the Corporate Council of Education of the Conference Board of Canada (1992) identifies three categories of skills required of the Canadian workforce: academic skills; personal management skills; and, teamwork skills. The survey of Employability Skills in Technology Programs, BCIT, (1994) delineates skills in the context of technological education. Findings of both surveys agree with a similar United Kingdom project, Harvey and Green (1994), Employer Satisfaction: Quality in Higher Education Project, which reported the following generic capabilities as sought by employers when recruiting: conceptual skills; analytical and problem solving skills; communication skills; interpersonal skills; the ability to work in teams; and, the desire to learn and continue learning. Essential qualities required were: self esteem; self motivation; leadership; and, responsibility. Building on prior research, Debling and Behrman (1996), identified employability skills pertinent to small and medium sized enterprises in British Columbia. As many generic skills are acquired as a result of “process” rather than “content,” the model of the Bachelor of Technology degree necessitates a conscious shift of emphasis from content to process, and from the acquisition of knowledge to the ability to use it.

The inclusion of Management Studies in the curriculum of all Bachelor of Technology degrees recognizes that economic restructuring has resulted in managerial and entrepreneurial skills becoming an important subset of generic skills. Corporate interviewees strongly endorsed management studies. In the opinion of one corporate employer, “if technologists, be they nurses or engineers, want to move beyond that narrow focus, then having the broader management perspective is vital.”90 Another corporate employer added “they need to learn leadership skills and skills in working in teams.”91 Documented evidence is supportive. The SPARK Report (1992) points out that:
Within five years of being hired for technical competence, employees are typically transferred to jobs that require a mix of technical and management skills. However, due to the bias toward technical issues within the industry, both employees and employers are often untrained and unaware of the need for relevant business skills. In today’s aggressive global market, the managerial expertise to finance and sell a knowledge-based product or service is as important as the skill to develop it (p.12).

Lynton and Elman (1988) assert that workplace re-organization resulting in less clearly defined management lines require all employees to have some knowledge of managerial and organizational practices. In particular, Skills, Training and Education and the British Columbia Labour Market, (1994) cites the significant growth in small businesses (91% of B.C. firms in 1991) and self employed persons (7.3% growth in 1993) and, as a corporate informant employed in a medium sized enterprise sector pointed out, “in smaller companies there will not be many promotions before they will have to be part of a management team.”

This necessitates an increased focus on managerial skills, small business training and entrepreneurial skills to produce graduates who can succeed in small business settings.

The Liberal Studies component of the Bachelor of Technology degree acknowledges that traditionally technologists have not had the benefit of a liberal education. As a result their perspectives may be limited. A corporate employer agrees, adding “I think the world today is filled with very talented people that are peaked out by their lack of broader focus.” However, as the Human Resource Development Project Report, (1992) points out:

The complexity of social and ethical questions seems to increase without let up, .....a new emphasis on the social sciences and humanities and more sophisticated citizenship education are required to help us learn to function as members of a world community (p.9).

This indicates that technologists now require more than an array of technical skills; they need technical judgement, the ability to assess second and third stage effects of decisions. Many technical problems are increasingly social, political, ethical and even international. Unlike technical and scientific approaches, which lead to a well defined, preferred solution, societal
and workplace issues may have multiple solutions all of which have value and merit. Employees need competence in decision making where human values, both ethical and aesthetic, are necessary parts of the equation.

Numerous surveys\(^9\) have revealed employer dissatisfaction with the communication and analytical skills of a workforce that is trained merely technically (Skosnik, 1996). Comparisons are made with university educated workers who are perceived as more adaptable and better prepared to meet new challenges. *Training for What* (1995) recognises liberal studies as a “good source of analytical, critical thinking and problem solving skills — the foundation of a employability skills” (p.43). Referring to Skosnik’s parallels between the “trivium” and contemporary literature, the primacy of employability skills — communication and critical thinking — is inextricably rooted in the primacy of the liberal arts — grammar and logic. Allen (1996) drawing on statistical evidence of the superior communication abilities, specifically writing and speaking, acquired by humanities graduates, advocates integration of “academic” courses into technical/vocational programs.

The workplace, as a microcosm of society, is increasingly complex, diverse and uncertain. Interview data, particularly from the corporate sector, confirmed that employees need to develop “competence” (Lynton and Elman, 1988) to handle complexity and uncertainty in a continually changing environment. Lynton and Elman contend that competence to deal with complex situations is enhanced through a liberal education, and further suggests that liberal education is best presented as a synthesizing capstone, enabling application of knowledge to complex issues in the workplace and society. The model of the Bachelor of Technology degree reflects Lynton and Elman’s thinking and incorporates liberal studies as an integrative capstone.
The *Human Resources Development Project Report* (1992), validates the Bachelor of Technology curriculum, emphasizing an immediate need for advanced technical skill development, employability skills and different kinds of managerial skills.

**Communication Strategies**

All informants emphasized that ongoing communication with stakeholder groups was critical in the acceptance of BCIT's Bachelor of Technology Degree. Distinct communication strategies were used to demarcate and gain support for the Bachelor of Technology degree. BCIT's President acknowledges, "we took a different approach with each group because of certain needs and concerns each group had." Communication strategies moved from a low gear approach during the preparation of the proposal to a high gear approach following the release of the proposal.

**Low Gear Approach**

During the preparation of the Discussion Paper and subsequent Proposal, BCIT kept stakeholder groups constantly aware of its intention and progress using an informal, low key approach. Specifically, information sharing and feedback occurred between BCIT's senior administration and government officials on an ongoing basis. In contrast to the 1980s, BCIT was enjoying a good working relationship with government. According to an Assistant Deputy Minister, he and the President were in weekly e-mail communication. Drafts of the proposal were shared with Ministry personnel for their input. A former Deputy Minister attributed this approach to the BCIT President's experience in government and his knowledge of the political process recognising that:
seldom does a proposal go forward and get approved in the form it was submitted. ... so basically if you collaborate in the development of a proposal then ultimately something gets approved that everybody buys into at the outset.  

The Director of Universities and Provincial Institutes had been encouraging BCIT to consider degree granting and, although ministry staff had not been given specific direction, an Assistant Deputy Minister contends there was "just a sense that if BCIT was going to continue to play a high profile role, continue to have the prestige that it has had for several decades, then it is going to have to have some degree granting programs." The approach was collaborative. The Assistant Deputy Minister concedes, "we were very much in sync from the early stages...it was almost a joint proposal between BCIT and the ministry." 

Similarly, communication with the university sector was through informal discussion between BCIT's President and Vice President, Education and their university counterparts. As the President of BCIT recalls, the intent "wasn't so much to convince them that this was a good idea but, rather to show them that this was complementary and that BCIT was going to fill a different need in the market." The Dean of the School of Engineering Technology admits, "there was no way that BCIT would have gotten (sic) away with a degree in engineering or forestry." While none of the universities took an official position, they were generally supportive. A Vice President, Academic from the university sector conceded, historically, the universities are not good at thinking about degree programs in professional ways and related an incident of an attempt by the University of British Columbia to identify desirable outcomes common to all undergraduate programs being "laughed out of court" by Senate. He added, "the notion that you start by saying what you want your graduate to be is just not something the university culture is well attuned to." Economically, there was a labour market need for advanced technological expertise and upgrading opportunities in British Columbia. In the opinion of BCIT's President, the universities recognised that, by
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BCIT filling this differentiated role, universities would be spared government pressure to fill it themselves. An Assistant Deputy Minister agreed:

Most of the creativity and innovative nature of the degrees clearly came from BCIT. I think if it had not been there the ministry would have tried to steer the universities towards more of that.\textsuperscript{102}

Communicating with industry, and specifically advisory committees, BCIT was mindful of their concerns for the effect of degrees on the value of the diploma. A consultative “bottom up” approach was used. Rather than presenting BCIT as a degree granting institution and seeking support, BCIT conferred with individual industry sectors to identify advanced training needs and then demonstrated how the proposed Bachelor of Technology degree would build on the diploma and on the advanced-diploma enhancing, rather than detracting from, each.\textsuperscript{103} Emphasis was on degrees only being offered in selected areas of demonstrated market need.

Internal communication with faculty occurred on a consultative basis from the outset, initially through Education Council, Staff Society and the later in the process through open forum. Communication focused on assurances that the introduction of a degree would not put further expectations on faculty or be at the expense of current programs:

We didn’t tell them they had to teach degree programs. We didn’t tell them they had to do applied research. We didn’t tell them they had to change anything. We just went at it that this was something in addition that we were going to do and this is how we were going to do it. Here were the benefits to them. We made sure we didn’t create a new category of faculty members. We didn’t make one job better than the other in prestige and pay and recognition or anything.\textsuperscript{104}

As discussed in the section, Supportive Internal Community, faculty responded to this consultative approach with no threat of job security and appeared to be supportive or neutral.
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High Gear Approach

Following the release of the document, *Proposal for a Technology Degree at BCIT* (May 1992), the communication strategy became a high gear formalized approach using calculated marketing tactics. BCIT's Marketing and Development through the Office of Corporate Relations was given the responsibility of developing strategic communication plans for the promotion of the degree proposal to both government and industry. Two consultative sessions were held with focus groups of selected faculty, managers and administrators, specifically to determine demarcation strategies for government and industry audiences:

- Our objective will be to develop the key messages that will be communicated to these groups to ensure support for the necessary changes to legislation permitting BCIT to grant degrees.105

There was a sense of urgency to demarcate the Bachelor of Technology degree and present it as a high value alternative to the university model. The key messages were identified for government and industry (Appendix 7D). Guidance on strategies to build support for the Bachelor of Technology degree was sought from local MLA’s, members of the Board of Governors, and the Director of Public Affairs, Ministry of Advanced Education, Training and Technology. Approaches, and key people for harnessing support from political parties, the science and technology community, and the community colleges were suggested.106

A Degree Communications Workshop for senior managers was held in January 1993 to propose marketing tactics and marketing materials. Sample presentation materials were displayed. The rationale for the Bachelor of Technology degree presented in the *Proposal for a Technology Degree at BCIT* (May 1992) was condensed into a six page brochure focused on targeting key messages to various stakeholder groups and designed primarily to complement direct personal contact with target audiences, but with stand alone qualities to build a convincing case for the degree. A month later the Vice President, Education required
action plans from senior managers detailing intended target markets, methods of communication and anticipated timeliness.\textsuperscript{107}

As early as March 1993, the Marketing Department began to anticipate the government’s announcement of degree granting status for BCIT. Press releases were prepared, potential media questions were predicted and question and answer sheets were drafted. The announcement did not occur and the marketing drive slowly waned. The Bachelor of Technology degree was finally on May 3, 1994. Communication strategies for individual degrees had to wait for approval of the specific degree by the Degree Program Review Committee.

**External and Internal Constraints**

Considerable overlap exists between internal and external factors which constrained the degree initiative. Discussion will therefore combine components.

**Fear of Devaluing the Diploma**

BCIT’s successful diploma program both enabled and constrained the creation of the Bachelor of Technology Degree. While institutional reputation, built on the successful diploma program and the graduates it produced, was a crucial enabling factor, it also proved a constraint. Interviewees from all stakeholder groups identified fear of devaluing the diploma as the major constraint, and re-emphasized an ongoing market need for the diploma. These concerns reflect the constraining effect of the diploma first apparent in the two investigative task forces, The Task Force to Examine Technological Training in Engineering, Health Science and Related Fields in British Columbia and the Committee to Examine the Extension
of Training at BCIT, established by the Ministry in 1980. Fear of the demise of the diploma program relates directly to a broader constraint expressed by several interviewees; part of the post-secondary system saw degree granting as detracting colleges and institutes from their main mission. The Park Report (1987) implied similar misgivings, rejecting degree granting status which it envisaged as a move from BCIT's mission suggesting that:

the establishment of degree programs at BCIT would threaten the fundamental purpose of the institution, which is to produce graduates of two year diploma and post diploma programs (p.39).

As noted previously the model of the Bachelor of Technology degree was designed specifically to address this concern.

**Government Delays**

Interview data and participant observation identified government postponements between the unofficial and the public announcement of baccalaureate status for BCIT, combined with further delays in the enabling legislation, as significantly impeding BCIT's preparatory work for its first degree programs. BCIT's President estimated that these ongoing hold-ups caused delay in implementation of BCIT's first degree in excess of a year.\(^{108}\)

The *Proposal for a Technology Degree at BCIT* was submitted to government in June 1992, and while feedback was positive: "I assure you, BCIT's aspirations will be included in the plans the Ministry has for degree granting legislation,"\(^{109}\) the announcement of degree granting status for BCIT did not occur until two years later in May 1994 and enabling legislation was not enacted until January 1995. A further delay of a year was incurred prior to BCIT implementing its first degree. This caused a considerable amount of frustration and uncertainty in the institution.
British Columbia was the first province to give degree granting status to a significant number of institutions in the non-university sector, and delays occurred as the government wrestled with a process to ensure the credibility of these institutions and consequent legitimacy of their degrees. Delay in awarding BCIT degree granting status was due to three distinct, but interrelated factors: institutional governance issues, development of a provincial degree approval process, and political implications of appropriate timing.

**Institutional Governance**

Prior to January 1995, British Columbia's colleges and institutes were governed by a unicameral system. All governing authority resided with the Board of Governors. Faculty had no legislated decision making authority in educational matters. The College and Institute Act of British Columbia (1977) Part 4, Section 12(b) requires that:

> a program advisory committee be established which shall include professional employee and student representation (Part 4, Section 12(b).

However, the mandate of this committee was not stated. The amount of faculty input to educational policy, and the means by which this was acquired, varied among institutions. The advent of university colleges and provincial institutes as degree granting institutions indicated a growing diversity in a system where initially only universities granted degrees. This raised the question of accreditation and standards. Currently, Canada has neither a national nor individual provincial accreditation system. Credibility as a degree granting institution is recognized by membership in the Association of Universities and Colleges in Canada (AUCC). The requirements for membership in AUCC requires faculty authority in academic or educational decisions:

> Collegiality requires there be peer participation in the academic decision making process (Appendix B (3)).
This precedence for AUCC membership caused the provincial government to question the perceived legitimacy of degrees from university colleges and institutes within the post-secondary sector:

We have been struggling with the process etc. What do you propose to do with the governance issue? Some, including the deputy, believe that you cannot be ‘legit’ without AUCC blessing and that you cannot get that without significant governance changes.\textsuperscript{110}

The President's reply reflects the mandate and culture of BCIT deeming acceptance in the market place rather than by other institutions, as a benchmark of success:

I am not too concerned about AUCC at this stage. When BCIT was formed the diploma was an odd ball credential. It gained legitimacy quickly because business accepted the graduates. The model we are going to use to approve degrees internally we feel meets the AUCC criteria. We will add to that, an external validation which should put us on solid ground with the market.\textsuperscript{111}

However; BCIT, in formulating its internal degree validation process, had intentionally crafted the institutional validating body, the Technology Degree Committee, to comply with AUCC requirements. The committee was made up of the Vice President of Education, five faculty members and two members of the Board of Governors. The Board agreed to vest its authority in these two members, enabling the final authority on the educational integrity of degrees to be a body with a majority of faculty.

Governance issues raised, as institutions in the non-university sector were designated degree granting, resulted in governance in British Columbia's colleges and institutes being revisited by the Carter Committee on Governance of Colleges and Institutes established in August 1992 by the Minister of Advanced Education, Training and Technology. The recommendations of the committee were received by the Minister in June 1993. Ultimately, the most significant changes to the governing structures of colleges and institutes resulting from these debates were: elected faculty and student representation on the Board of
Governors; and, a legislated requirement for an Education Council within each institution with legislated authority in specific areas. The new governing structures were incorporated into the legislation in January 1995.

**Provincial Quality Approval Process**

The emergence of new degree granting institutions, some offering non-traditional degrees, raised concerns about appropriate approval processes to ensure quality and standards. In June 1993, Dr. Jack Newberry, Director, Universities and Provincial Institutes, circulated a Discussion Paper, *Degree Approval and Quality Assurance*, to focus debate and discussion among stakeholders in the B.C. post-secondary system on these topics. In an accompanying letter, Dr. Newberry exhorted, “Developing a ‘Degree Approval Process’ is urgent due to the proposed timetable for anticipated legislative changes.”112 The targeted date for implementation of the process was early Autumn 1993. The main recommendations of the Discussion Paper were: the formation of a provincial Standing Committee with the overall responsibility for managing the approval process for all new undergraduate degrees; a two stage approval process; and, different categories of undergraduate degrees. While there was agreement in principle from BCIT to the suggested degree approval process and the formation of a Standing Committee, reaction to the recommendation of a hierarchial structure of degrees was swift and angry. A member of BCIT’s Board of Governors remarked, “I felt the hair on the back of my neck stand up when I read that.”113 The Discussion Paper differentiated between the traditional theoretically focused university degree that led to graduate degrees in the discipline or professional degrees, and an emerging degree in British Columbia described as one:

> with a more direct focus on employment goals. These degrees, be they technology based, social service based, applied arts based or other bases, share some characteristics with traditional degrees but have significantly distinctive features.
Such degrees tend to focus on practice in the occupation, may have problem-centred curricula, likely in some significant measure taught by practitioners with field experience, but perhaps somewhat less academic qualifications than traditional university professors, and may not lead directly into graduate studies (MAETT, 1993, p.2).

The paper proposed two categories of degrees with two sets of criteria for adjudication and asserted that such a system would maintain the integrity of each category's degree. Feedback to the paper argued to the contrary. Rather, it argued that the proposed approach would be interpreted as a two-tiered hierarchial system; the first open-ended to graduate school, the second dead-ended. Watson expressed concern that the current disparity between diplomas and degrees not be transposed to the applied degree versus the academic degree through the adoption of two hierarchial categories of degrees. An alternative approach was suggested whereby guiding principles be developed which lead to criteria against which all degrees could be assessed.

An appropriate degree approval process was of concern to both new and established degree granting institutions. University degrees also were to be included in this external validation. Discussions took place in the Fall 1993 between the University Presidents' Council (UPC), through the Vice Presidents Academic Committee (VPACCOMM), Senior Instructional Officers' Committee (SIOC) and the College Chief Executive Officers (CCEO) and led to the submission to government in January 1994 of a suggested New Degree Approval Policy. At this point the whole process appeared to lose momentum. Significant delays occurred within the Ministry due in part to the resignation of Dr. Newberry as Director of Universities and Provincial Institutes and to a structural reorganization as the Ministry of Advanced Education, Training and Technology was replaced by the Ministry of Skills, Training and Labour. Throughout 1994 communication from the Ministry on the progress of the degree approval process was minimal. Frustration and uncertainty increased at BCIT: The institution
waited to ensure that its own established quality assurance process articulated well with the requirements and structure of the ministry process. Furthermore, this holdup was seen as another reason for delaying the enabling legislation.

The Ministry’s draft proposal for new degree approval process was released on Nov 4 1994 and caused concern for institutions offering non-traditional practice-based applied degrees: “Overall the draft falls short of the type of Degree Approval Process needed to encourage and approve new degree programs in B.C.” The draft appeared to ignore the considerable level of agreement reached between the Academic Vice Presidents of the universities, colleges and institutes in the latter part of 1993 and “was a disappointment, given the discussion of the past eighteen months around this issue.” Debate centred around the membership structure and appropriate terms of reference for the Standing Committee, named the Degree Program Review Committee (DPRC). BCIT’s President expressed evident concern:

I think the Degree Program Review Committee as described will not likely be a vehicle for progressive change. With the majority of its membership coming from academic faculty or university nominations, the odds of it being a conservative force are very high indeed. I see a need for high quality, practical applied degrees in this province and I am very concerned that a review committee structured as you propose will tend to base its judgements on ‘academic’ issues rather than looking at the future and industry needs. A review focused on academic issues might be comforting to those for whom standards are more important than change but it won’t get us to where we want to be as an economy.

It was critical that the Degree Approval Process champion both the development of new academic degrees and the introduction of applied/occupational degrees. The representative structure of the validating committee and the assessment criteria were crucial to ensuring this. The draft proposal stated, “the primary function of the DPRC is to ensure a consistency of academic standards for degree programs throughout the province,” (p.4). Arguing that “consistent” implies convergence towards a discipline based approach and corresponding
implicit values of existing degrees and furthermore, that new applied/occupational degrees need a fair and level playing field to be judged on, congruent with their own value system, Gillespie, BCIT’s Vice President, Education suggested the DPRC ensure an “appropriate level of educational standards” for all degrees. Iterations of the Degree Approval Process continued for a further six months. The first meeting of the Degree Program Review Committee was held on June 12, 1995 at Simon Fraser Harbour Centre.

Political Timing

Political implications of the timing played a major role in delaying the announcement of BCIT’s Bachelor of Technology degree. This was attributed partly to two operational modes of government. First, everything was driven by press releases. In a former Deputy Minister’s opinion, “we had the most event and press release and ink and television time motivations, that I have seen in Canada.” An Assistant Deputy Minister added, “it wouldn’t be at all unusual to lose two, three, four months before you could get the right politicians lined up and the right event to make the announcement.”

Second, the NDP was more consensus driven than any other government. The political interpretation of this implies a delay in announcing degree granting status for BCIT until it coincided with the university colleges becoming autonomous degree granting institutions, and within two weeks of the announcement of a Technical University for the Fraser Valley.

The proposal submitted to government in May 1992 received approval from Cabinet in August 1993. Although the Minister was anxious to make the announcement in September 1993, an impending cabinet shuffle prevented this. The cabinet reorganization resulted in a change of Minister. Concurrent with these developments, the Skills Now initiative was being hatched by the policy and planning secretariat arm of government and, rather than a series of
adhoc announcements, government intended a more comprehensive package “timed for maximum benefit for an upcoming election.” As mentioned previously, the Bachelor of Technology degree formed part of the Skills Now package announced on May 3, 1994.

A chronology of primary research documents provides supportive evidence of delays. For example, BCIT’s Proposal for a Technology Degree was submitted to government in June 1992. The proposal received cabinet approval in August 1993, however, the official announcement of the Bachelor of Technology was delayed eight months until the release of Skills Now in May 1994. Legislation endowing BCIT with degree granting authority, Bill 23: Amendment to the Institute of Technology Act, was passed January 15, 1995. Erroneously, however, this Bill restricted BCIT to granting two degrees only, Computer Systems Technology and Critical Care Nursing. Consequently further delay was incurred until an Order in Council gave approval for Bachelor of Technology degree designation in general.

The intent of this study is to document and analyse the legitimation of practice-base technological knowledge, however throughout the study it became apparent that rather legitimation of the institution had occurred. The researcher asked all interviewees if they perceived that government had differentiated between these issues, one pedagogical and the other political, in the decision process. All interviewees, including government personnel, were of the opinion that the distinction had not been made. The fact that the Bachelor of Technology degree differed markedly from a traditional academic degree appeared not to have been noted let alone considered.
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Summary

Analysis of the research findings grouped influences external to BCIT into five major categories or factors, and internal influences into six categories. Sub-categories evolved within some of these groupings. BCIT’s successful bid for a Bachelor of Technology degree was due to the convergence of these external and internal influences. The study identified five major external enabling factors. First, the changing needs of the workplace. Sub-categories within this section identified, a prevailing skills mismatch, the inadequacy of the two year diploma to meet workplace needs in some areas, and the lack of alternate paths to degree level studies as exists in some other countries. Second, the perceived lack of balance within British Columbia’s post-secondary system. Access for All had expanded opportunities for academic programs but there remained limited availability of applied programs and inequality of opportunity for laddering to advanced credentials within these programs. Third, the increasing demand by diploma graduates for career mobility and upgrading opportunities. Fourth, accountability; particularly with reference to duplication of costs due to recycling of students. Fifth, the timing of the initiative. The term, “the time was right” was used frequently integrating other identified factors.

Six major internal enabling factors were identified. First, institutional leadership proved to be a pivotal factor. Second, was BCIT’s reputation. Third, a supportive internal community was evident. This included faculty, managers, administrators and the Board of Governors. Fourth, the “stepping stone” approach established an infrastructure for degree level work and demarcated a market niche. Fifth, was the model of the Bachelor of Technology degree; both the structure and the curriculum of the degree were deemed enabling. The enabling structural features identified were: the relationship to the diploma; flexible delivery mode; and,
demonstrable accountability. Sixth, ongoing communication fostered collaborative relationships with both government and advisory committees and a “bottom up” approach internally.

The study determined two factors constraining the establishment of a Bachelor of Technology degree: fear of devaluing the diploma and consequently detracting BCIT from its main mission; and, government delays. Delays were attributed to three factors: governance issues, provincial quality assurance issues and political timing.

Footnotes

1 Member of corporate sector and advisory committee member: Interview, October 10, 1996. Member of corporate sector and former member of BCIT Board of Governors: Interview, September 4, 1996.


3 Dean, School of Health Sciences: Interview July 26, 1996.

4 Former President, BCIT: Interview, August 4, 1995.

5 Member of corporate sector and former member of BCIT Board of Governors: Interview, September 4, 1996.

6 Former President, BCIT: Interview, August 4, 1995.

7 Faculty Member: Interview, September 26, 1996.

8 Ibid.


10 Dean, School of Health Sciences: Interview July 26, 1996.

11 Former Associate Dean of Nursing: Interview, July 25, 1996.


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14 President of BCIT, Interview: July 10, 1996.
   Dean, School of Health Sciences: Interview July 26, 1996.

15 Assistant Deputy Minister: Interview, August 30, 1996.

16 Vice President, Academic, University Sector: Interview, October 7, 1996.

17 Member of corporate sector and former member of BCIT Board of Governors: Interview, September 4, 1996.

18 Ibid.

19 Assistant Deputy Minister: Interview, August 30, 1996.
   Former Deputy Minister: Interview, August 12, 1996.

20 Assistant Deputy Minister: Interview, August 30, 1996.
   President of BCIT, Interview: July 10, 1996.

21 Former President of BCIT: Interview, October 1, 1996.

22 Former Minister: Interview, September 17, 1996.

23 Former Chair of BCIT Board of Governors: Interview, September 16, 1996.

24 Faculty Member: Interview, September 26, 1996.

25 Former Deputy Minister: Interview August 12, 1996.

26 Faculty Member: Interview, September 24, 1996.

27 Dean, School of Engineering Technology, BCIT: Interview, August 29, 1996.

28 Former Associate Dean of Nursing: Interview, July 25, 1996.

29 Former Minister: Interview, September 17, 1996.
   Former Deputy Minister: Interview August 12, 1996.
   Assistant Deputy Minister: Interview, August 30, 1996.
   Former Director, Universities and Provincial Institutes: Interview, August 29, 1996.
   Former President, BCIT: Interview, August 4, 1995.
   President of BCIT, Interview: July 10, 1996.

30 Former Associate Dean of Nursing: Interview, July 25, 1996.

31 Former Minister: Interview, September 17, 1996.

32 Former Minister: Interview, September 17, 1996.

33 Former Vice President, Education, BCIT: Interview, October 7, 1997.

34 Former President of BCIT: Interview, October 1, 1996.

35 Former Associate Dean of Nursing: Interview, July 25, 1996.

36 Dean, School of Health Sciences: Interview July 26, 1996.

37 Former Deputy Minister: Interview August 12, 1996.

38 Ibid.

39 Assistant Deputy Minister: Interview, August 30, 1996.

40 Former Director, Universities and Provincial Institutes: Interview, August 29, 1996.

41 Assistant Deputy Minister: Interview, August 30, 1996.

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42 Former Deputy Minister: Interview August 12, 1996.
43 Dean, School of Engineering Technology, BCIT: Interview, August 29, 1996.
44 Faculty Member: Interview, September 26, 1996.
45 Ibid.
46 Vice President, Academic, university sector: Interview, October 7, 1996.
47 Member of corporate sector and former member of BCIT Board of Governors: Interview, September 4, 1996.
   Member of corporate sector and advisory committee member: Interview, October 10, 1996.
48 Faculty Member: Interview, September 24, 1996.
49 Former Deputy Minister: Interview August 12, 1996.
50 Member of corporate sector and advisory committee member: Interview, October 10, 1996.
51 Member of corporate sector and former member of BCIT Board of Governors: Interview, September 4, 1996.
   Member of corporate sector and advisory committee member: Interview, October 10, 1996.
52 Member of corporate sector and advisory committee member: Interview, October 10, 1996.
53 Former Director, Universities and Provincial Institutes: Interview, August 29, 1996.
   Assistant Deputy Minister: Interview, August 30, 1996.
54 Former Director, Universities and Provincial Institutes: Interview, August 29, 1996.
55 Faculty Member: Interview, September 24, 1996.
   Faculty Member: Interview, September 26, 1996.
   President of BCIT, Interview: July 10, 1996.
56 Faculty Member: Interview, September 24, 1996.
57 Faculty Member: Interview, September 26, 1996.
58 Former Vice President, Education, BCIT: Interview, October 7, 1997.
59 Member of corporate sector and former member of BCIT Board of Governors: Interview, September 4, 1996.
   Member of corporate sector and advisory committee member: Interview, October 10, 1996.
60 Former President, BCIT: Interview, August 4, 1995.
61 Assistant Deputy Minister: Interview, August 30, 1996.
62 Ibid.
63 Former Minister: Interview, September 17, 1996.
   Assistant Deputy Minister: Interview, August 30, 1996.
64 Former Chair of BCIT Board of Governors: Interview, September 16, 1996.
65 Dean, School of Engineering Technology, BCIT: Interview, August 29, 1996.
   President of BCIT, Interview: July 10, 1996.
   Dean, School of Health Sciences: Interview July 26, 1996.
66 President of BCIT, Interview: July 10, 1996.

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Since the mid-eighties, BCIT’s Industry Services Department has conducted numerous industrial surveys on training needs for the skilled workforce. On all of these surveys, the lack of analytical and problem solving skills has been identified as a significant problem. (Skosnik, 1996)
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97 Assistant Deputy Minister: Interview, August 30, 1996.
98 Ibid.
99 President of BCIT, Interview: July 10, 1996.
100 Dean, School of Engineering Technology, BCIT: Interview, August 29, 1996.
101 Vice President, Academic, university sector: Interview, October 7, 1996.
102 Assistant Deputy Minister: Interview, August 30, 1996
103 President of BCIT, Interview: July 10, 1996
104 Ibid
105 Manager, Corporate Relations to Focus Groups: E-mail, June 6, 1992.
106 Manager, Corporate Relations to President of BCIT: Memo, July 24, 1992.
107 Vice President, Education to Deans: Memo, February 9, 1993.
108 President of BCIT, Interview: July 10, 1996
109 Tom Perry, Minister of Advanced Education Training and Technology, to Wynne Powell, Chair, Board of Governors, BCIT: December 16, 1992).
110 Assistant Deputy Minister to President, BCIT: E-mail, April 19, 1993.
111 President, BCIT to the Assistant Deputy Minister: E-mail, April 20, 1993.
113 Participant — Observation.
116 Ibid.
117 John Watson to Nick Rubridge: E-mail, November 9, 1994.
119 Former Deputy Minister: Interview August 12, 1996.
120 Assistant Deputy Minister: Interview, August 30, 1996.
121 Former Deputy Minister: Interview August 12, 1996.
122 Former Minister: Interview, September 17, 1996.
123 Assistant Deputy Minister: Interview, August 30, 1996.
Chapter Eight: Conclusions
The purpose of this study was to document and analyse a process by which applied knowledge achieved formal legitimacy. This historical case study focussed on a unique case, the creation of a Bachelor of Technology degree at BCIT. Specifically the study analysed factors external and internal to BCIT which enabled or constrained the elevation of practice-based technological knowledge to degree status. While the intent of this study was to focus on the pedagogical question of the legitimation of practice-based applied knowledge, the findings of the study show that many of the enabling factors were political, pertaining to legitimation of the institution. Differentiation by the state between these issues, one pedagogical and the other political, was not apparent in the decision process; the legitimation of applied knowledge occurred to a great extent because of the legitimation of the institution. The conclusions of the study reflect the blurring of these questions.

The overall findings of the study indicate that this new level of legitimacy afforded applied knowledge in British Columbia cannot be attributed to any one particular source. Rather, the study reveals a convergence of factors both external and internal to BCIT, the integrative factor being “timing.” The findings can be encapsulated as follows: the proposal for a Bachelor of Technology aligned with government’s vision; government had confidence in BCIT as a degree granting institution; the political environment was “safe”; and, the approach was cost effective and accountable.

Alignment with Government Vision

The over-arching enabling factor was that BCIT’s desire to elevate the status of applied knowledge and the intended implementation strategies were directly aligned with what had been on government’s policy agenda for some time. The external influences driving these policy agendas were those driving the degree initiative and can be conveniently categorized
into two interrelated areas: issues of access; and the need to provide an appropriately skilled and educated workforce for a changing economy.

**Access Issues**

Access pertains to what is implied in the literature as the move from an elite to a mass higher education system. Canada initially moved towards mass education in the 1960s through the creation of community colleges. By the 1980s demand for more post-secondary education had escalated to demand for more degree level studies. British Columbia’s response was the creation of university colleges through the Access for All initiative. However, university college offerings further distorted what was already an academically biased system. The political intent to extend the Access initiative to applied programs was negated through fiscal constraints. Opportunities for advanced level studies in applied programs were very limited. The study revealed that the political will to counter the lack of balance in the system prevailed and was a key factor in elevating applied knowledge to degree level. BCIT with its applied focus was strategically well placed to play a leading role in any corrective move.

Lack of attention to applied studies had resulted in both limited availability and inequality of opportunity within applied programs for well articulated transition to higher levels of study within British Columbia. The model of BCIT’s proposed Bachelor of Technology degree addressed these issues the following ways. First, an innovative and flexible delivery mode through part-time study and in many cases by distance education, increased access to students constrained by time or geographic location. Students could enhance their career opportunities with minimum financial loss; the province could upgrade its human resource without depleting its workforce. Second, the model provided an efficient, well articulated path to a degree for diploma graduates. Advancing credentialism was increasing graduates’ demands
for access to recognized higher levels of learning for career mobility, reflecting Silver's (1980) assertion that the power of the "expert" depends on the accreditation of his knowledge, and consequently, that knowledge as power is linked not only with skill and occupation but with qualification, credentials and accredited institutions. Previously, poor articulation with the university sector was fuelling duplication of learning and recycling of students within the post-secondary system at considerable cost. The model of the BCIT degree eliminated the duplication of effort as the diploma became the first two years of the degree. Diploma graduates now have the opportunity to ladder to a degree, with full credit recognition for their diploma and to retain the practical focus of their studies. Although access is a political issue, the economic repercussions in the potential waste of human capital and the duplication of cost and effort associated with the recycling of students within the system due to lack of opportunity for advanced level studies in applied programs, proved to be key determinants in the decision to legitimize the Bachelor of Technology degree.

Third, the "building block" model of the degree, enabling diploma or degree graduates from other institutions to bridge into the degree program, aligns with government policy championing an integrated "system" approach to post-secondary education in the province. Moreover the model converged with the vision of a seamless system of career/technical education with smooth articulation from the trades to degree level studies, as advocated in state policy documents such as: Human Resource Development Report, (1992); Skills Now, (1993); and, Training for What?, (1995).
Building a Skilled Workforce

The findings of the study indicate changes in the external environment due to economic restructuring was a significant driver in BCIT's bid for degree granting status. The shift in the provincial economy from resource based to a knowledge based means greater reliance on human capital in the provision of a skilled and educated workforce for comparative advantage. A knowledge based economy requires a workforce with different skills and knowledge, specifically one with advanced skills in the application of knowledge. A restructured economy was accompanied by new workplace organizational structures requiring expanded skill sets, for example managerial skills and competence in dealing with more diverse and complex issues. BCIT with a mandate to provide a workforce to support the provincial economy and with its focus on technology and the application rather than acquisition of knowledge, was strategically well placed to provide higher level applied knowledge. BCIT's unique focus provided the central argument in demarcating the Bachelor of Technology degree. The findings of the study acknowledged that growth of technological knowledge meant that the two year diploma was inadequate in some areas to provide sufficient expertise to sustain performance in a rapidly changing environment. Moreover there was increased employer demand for higher levels of education as evidenced by the demands or professional bodies. The study indicated that the degree was the preferred credential for students extending their learning beyond two years.

The model of the degree enabled graduates to upgrade with full recognition of prior learning consistent with the philosophy of life-long learning. Statistical analysis of job opportunities and unemployment in Canada suggest a prevailing mismatch of skills. A degree credential was seen as a motivator to encourage educational upgrading. The need for a skilled workforce provided a new context for degree granting at BCIT. In contrast to the 1980s
where a submission for degree granting was viewed within the traditional context, that of academia, the recent submission was viewed within the context of creating and motivating an educated workforce and was more aligned with government policy. Support for an increasing focus on application of knowledge in building a skilled workforce for the new economy is emphasised in policy documents such as Intermediate Skill Development in British Columbia, (1997), Training for What?, (1995), and Premier’s Council Report, (1990). Although the quantitative findings of Training for What? were challenged by Allen (1996), Allen’s own research indicated the highest employment trends in applied areas. Overall, there is little disagreement that a changing economic base requires a changing knowledge base. Acknowledgement of this is evident as universities currently re-examine their vocational role.

Practice-based applied knowledge gained recognition at baccalaureate level to promote economic advantage and competitive edge in a changing societal structure. The study confirms and extends the linkage seen by Silver (1980) between knowledge and power. Power structures have become increasingly aligned with economic dominance. In the pre-industrial era, economic advantage belonged to the aristocracy and the knowledge component esteemed by this elite rested in a liberal education. The onset of industrialization saw power reside in the “expert knowledge” of the professional. The latest shift to a high technology society, reveals a further move to legitimate that body of knowledge which supports and fuels the new power structures.

The conclusion that alignment of BCIT’s proposal for a Bachelor of Technology degree with government policy agendas was a significant enabling factor, supports Moran’s (1991) contention that state legitimation may be influenced by contemporary economic and social
policies and the extent to which the institution or field of knowledge can further the political agendas.

**Government Confidence in BCIT**

A key determinant in the legitimation of applied knowledge was government confidence in BCIT and in its readiness to take on the role of degree granting institution. The study determined that this confidence stemmed from several interconnected internal factors.

Overall was a respect and acknowledgment of the reputation BCIT had built over the past three decades, both within the business community and within the post-secondary sector. BCIT had a positive image in the market place evidenced by the high placements of diploma graduates. The advisory committee structure was seen as validating employment relevant education in addition to providing linkage and advocacy with the corporate sector. In addition to a proven track record at the two year diploma level, BCIT's "stepping approach" to baccalaureate education via advanced diplomas and collaborative degrees with OLA had demonstrated success in degree level studies. Student demand had demonstrated a labour market need. The progressive approach had validated flexible and innovative delivery methods of part-time study and distance education for baccalaureate level work, and was aligned with ways government was seeking to improve access to people constrained by work commitments, time or location. Institutional reputation is an affirmation of horizontal legitimacy and confirms the work of Trow (1984) and Moran (1991) as a component of institutional legitimacy.

Government confidence in BCIT crystallized around the change in institutional leadership. The appointment of John Watson as President of BCIT was the pivotal factor in BCIT's bid
for degree granting status. Watson’s credibility with government, his working knowledge of
government and the political process, his visionary perspective and the administrative team
he selected added to government confidence.

Other internal enabling factors cited in the study are largely a result of Watson’s leadership,
his personal characteristics and his open and consultative management style. Specifically the
communication strategies adopted by Watson and his new administrative team were key in
the success of the degree initiative for the following reasons. First, on-going communication
and information exchange with government during the development of the proposal fostered
a spirit of collaboration and confirmed the direction BCIT was taking. Second, internally the
consultative approach built a supportive community. Faculty had confidence in the
president’s vision for the institute, confidence in job security and supported the need for
BCIT to become degree granting to retain its viability in the competitive post-secondary
environment. Third, clear demarcation of the Bachelor of Technology degree through key
messages aimed at different stakeholder groups, gained the support of these groups and
nurtured a “politically safe” environment. BCIT built on its strengths, concentrating on areas
where it had carved a market niche and had competitive advantage. Boundaries staked
territory that focused on application of knowledge through technology, knowledge directly
connected to the workplace, and a knowledge base grounded in practice as distinct from
theoretically grounded applied university studies. Industry was confident that BCIT was
evolving to fulfill its mandate rather than shifting towards the “academic.” Universities and
university colleges were not challenged by these boundaries. Success based on clear
demarcation of a market niche where one can out perform competitors reflects Morgan’s
“population ecology” perspective of organisations.
Politically “Safe” Environment

The findings of the study revealed that government’s decision to confer degree granting status on BCIT was greatly facilitated by the prevailing political climate within the post-secondary environment. In contrast to the previous decade where the possibility of BCIT evolving into a polytechnic had met with considerable opposition, the political climate of the 1990s was seemingly more favourable. This is attributed to several factors: the access issues outlined previously heightened awareness of the need for greater baccalaureate opportunities particularly in the career/ technical areas. Moreover the “Access for All” initiative had terminated the universities’ monopoly on degree granting and there was an acceptance of degree granting institutions in the non-university sector. The overt competitiveness over role definition that was evident between BCIT and the colleges in the 1980s had dissipated. Furthermore four colleges had already been designated university colleges and the inclusion of BCIT with this group intended degree granting institutions was deemed politically “safe” in that it precluded accusations of differentiation from the college sector.

Politically, the universities were supportive. BCIT’s progressive approach to degree granting via advanced diplomas had clearly demarcated BCIT’s market niche. The universities recognized this niche as complementary rather competitive, eliminating the concerns of “turf” that were evident in earlier years. The boundary proposed did not interfere with traditional university territory; the knowledge units were distinct and not overlapping with existing degrees. As a result of BCIT’s boundary work, the universities accepted the Bachelor of Technology degree as a natural extension of BCIT’s mandate and a legitimate credential to fill new labour market categories requiring advanced technical skills. There was evident respect for BCIT faculty and programs, but a realization that attempts at program articulation, would be dysfunctional and detrimental to both university and BCIT programs. University
support also stemmed from the recognition that BCIT not filled this demand for baccalaureate credentialing of practice-based technological studies, the universities may well have been required to detract from their current mission to satisfy this need, and with government’s added expectation of greater flexibility and innovation in delivery methods.

**Cost Effectiveness and Accountability**

In the opinion of one interviewee “the best driver of all is the scarcity of money.” Given the shrinking resources available for post-secondary education, a crucial factor in government’s decision to formally legitimize technological education and confer degree granting status on BCIT, was the accountability and fiscal responsibility inherent in the proposed model of BCIT’s Bachelor of Technology degree. The Minister’s concern was value for money and appropriate use of public resources. Considerable recycling and duplication of effort and costs were occurring within the post-secondary system. University graduates attended BCIT to gain relevant work skills. BCIT graduates were given minimal credit as they pursued their only available path to a degree credential through the university. The Bachelor of Technology degree met the dual objectives of degree status and relevant work skills. Second, the cost infrastructure for the degree was already in place. The model of the degree incorporated established and funded advanced diploma programs as the advanced technical specialty of the degree. Re-allocation of funds from the advanced diploma to the degree program meant BCIT could implement degree programs at very little incremental cost. Third, the liberal education component of the degree would not incur cost to government; students would access existing courses from the college and university sector.

Accountability includes both promoting efficiency through an integrated “system” approach to post-secondary education and implementing measures to ensure quality programs. The
building block structure of the Bachelor of Technology degree enabling diploma students to get full credit for previous work was in line with the provincial agenda of a seamless system of education. BCIT’s rigorous quality assurance process of degree validation by peer review of internal and external educators and industry representatives, gave confidence in the quality and relevance of the degrees.

The claim that, “what” BCIT wanted to do and “how” they proposed to do it, aligned with government vision, is supported by the enabling factors determined by this study showing congruence with the four goals of Ministry’s Strategic Plan for the Future of British Columbia, Charting a New Course (1996), Relevance and Quality, Access, Affordability and Accountability.

**Constraints**

The major constraint in the creation of a Bachelor of Technology degree was concern that this new credential may devalue BCIT’s diploma. The diploma is regarded as the “cornerstone” on which BCIT has built an exceptional reputation. Both internal and external interviewees acknowledged initial apprehension. The design of the degree with the diploma as an integral building block in the overall degree structure, allayed these concerns. The study identified government delays related to governance issues, quality assurance issues and political timing constrained the announcement and implementation of the degree. The Carter Committee on Governance of Colleges and Institutes first met in November 1992, however legislation was not passed until January 1995. The advent of degree granting institutions in the non-university sector, suggested that an approval process for all degrees would ensure consistency of standards. Although formulation of a process began in Spring 1993, it was not completed until over two years later and legitimation of the first degree did not occur until February
1996. The study found that the timing of announcements by government, strategically determined for political gain added to the already significant delays.

**Differences from the 1980s**

BCIT was unsuccessful in its bid for degree granting status in the 1980s whereas a decade later the proposal received state legitimation. The study suggests that constraining factors of the 1980s were largely eliminated. These factors can be conveniently discussed around stakeholder groups. First, there was improved relationship with government. The 1980s witnessed a strained relationship between government and BCIT, driven in part by: BCIT actively opposing government and lobbying to retain its own Act; the restraint years of the 1980s; funding threats; and, the requirement BCIT to define its role and differentiate itself from the colleges. Furthermore the meld between BCIT and PVI fuelled an already tense situation. By the early 1990s the institution had well defined mandate, a change of leadership and a more collaborative relationship with government. Second, the faculty had mellowed. In the 1980s the faculty did not support the degree initiative. The “top down” approach to degree granting in the 1980 had generated fears of job security and accusations of lack of faculty input to a major policy decision. Faculty lacked confidence in the institutional leadership and a more adversarial climate prevailed on campus. By the 1990s both the internal and external environment had changed: there was confidence in the institutional leadership; a more consultative approach had deflected fears of job security; an educational council enabled input into educational policy; and, with the advent of university colleges and potentially a technical university, faculty acknowledged the viability of the institution. Third, the corporate sector largely supported the concept of a Bachelor of Technology degree. The bid for degree granting in the 1980s failed in part because the corporate sector did not see the need for baccalaureate level education for technologists. Furthermore, they feared the demise
of the diploma if degrees were introduced. By the early 1990s BCIT's "stepping stone" approach to degree granting with the advanced studies building on to the diploma, had demonstrated to industry through advisory committees, that the potential of a degree would enhance rather than devalue the diploma.

**Future Implications**

The literature reviewing the evolution and acceptance of applied knowledge in other jurisdictions reveals a hierarchial shedding of non-degree level work as institutions progress to higher levels of credentialing of applied knowledge and seek to differentiate themselves from the layers below in the institutional hierarchy. This was evident in the United Kingdom the Mechanics Institutes evolved into civic colleges and then into civic universities. In Australia, the establishment of the New South Wales University of Technology in 1949 resulted in transference of diploma courses from technical colleges ultimately to become degree programs at the university. The loss of this vital link of diploma programs had adverse effects on technical education in New South Wales. Colleges of Advanced Education discarded non-degree programs as they were absorbed into the university sector following Dawkins' reforms. In Canada, Ryerson exhibited academic drift from the outset, culminating in a perceived devaluing of diploma programs with the conferring of degree granting status in 1971.

These trends prompt speculation of potential academic drift at BCIT. To limited extent academic drift occurred when BCIT received its advanced technology mandate. Certain "lower tech." programs were transferred out of the institution while programs with a more "high tech." orientation were transferred in. However, certain differences exist between BCIT and the institutions reviewed above which may curtail the extent to which BCIT succumbs to
academic drift. First, BCIT is a very diverse institution with the largest trades training program in the province. It would appear inconceivable both from a practical and financial, not to mention political perspective that these programs be shed. Second, it is unlikely that BCIT will offer a comparable proliferation of degrees as these institutions. BCIT is mandated to provide employment relevant education and has a policy to offer degrees only where there is a demonstrated market need. Moreover, the presence of university colleges also supplying applied programs, a new technical university on the horizon with a mandate yet undetermined and a ministry process which monitors duplication and relevance of programs, may well temper the extent to which degree granting is part of BCIT's overall offerings. Third, historically, academic drift has occurred because of desire for increased institutional prestige associated with a stratification of knowledge. Currently, however, the external environment has changed to give more value and esteem to employment relevant knowledge. Moreover following Moran (1991) BCIT did not seek institutional legitimacy by conforming to the norms of traditional universities but deliberately chose to take the alternate route, building on its uniqueness to produce an upscale version of its basic model. Contemporary trends suggest, rather than a technical institution "drift" towards the established norms of the university, there is a tendency for both institutions to converge towards some middle ground as the university expands its vocational role and liberal studies become an integral part of a technical education.

Although BCIT determines not to succumb to academic drift, it faces a challenge of ensuring laddering opportunities to higher degrees. Historically, poor articulation arrangements rendered the diploma almost a terminal credential. This terminality must not be transferred to the degree. Institutions in other jurisdictions, for example, the Polytechnics in the United Kingdom, have evolved to confer magistral and doctoral degrees. As practice-based
knowledge in British Columbia appears to be following trends of these earlier institutions, albeit years later, it seems likely that higher technological degrees will evolve. Given the creation of a new technical university in British Columbia alongside a well proven institute of technology, it is not yet clear where or how such degrees will be housed.

Literature identifies an evolving relationship between higher education and professional associations, where higher education institutions have progressively played a greater role in acquiring professional status. In the United Kingdom and Germany engineering students from the polytechnics and the Fachhochschulen respectively, belong to the same professional association and university engineers. Currently, engineering technology graduates from BCIT’s Bachelor of Technology degree will not be eligible for professional status. BCIT’s engineering technology programs show strong support on an individual basis from professional engineers, however a future challenge will be to reconcile the student desire for professional designation while retaining the practice-based applied focus of the BCIT degrees.

The knowledge continuum ranges from the very theoretical to the very practical. Originally, degree status belonged to the theoretical end of the spectrum, however a historical trend is evident where baccalaureate status creeps increasingly closer towards the practical, legitimizing, first, theoretically grounded professions and now practice-based applied knowledge. Extrapolating this trend begs the question of degrees in trades in British Columbia.
Generalisation of Findings

Traditionally the external validity of a study marks the extent to which the findings can be transferred to other studies. This proves problematic in a unique case study such as this. As Merriam (1988) reminds us “one selects a case study because one wants to understand the particular in depth not because one wants to know what is true of many” (p.173). However, some parallels can be drawn. Although British Columbia’s abundance of natural resources obscured the urgency for higher level of credentialing of applied knowledge until 25 years after corresponding trends in the United Kingdom, Germany, Australia and Ryerson, the findings of this study identify similar drivers: social demand for access coupled with economic implications of manpower wastage and the need for a workforce appropriately skilled and educated to stimulate economic growth. Further commonality exists in the political will of governments to wrest the monopoly of degree granting from the universities bringing higher levels of learning “under social control and directly responsive to social needs” (Crossland, 1965).

This study identified leadership as a key determinant of success and confirms the contentions of Harman (1989) with respect to the Dawkins Reforms in Australia, and Wilkinson (1980) discussing educational changes at Ryerson. Both authors acknowledge the essential role of leadership in effecting major change and both attribute this to three attributes of the leader also evident in this study: the personal characteristics notably drive, vision, persuasion and political skills; a consultative approach; and strong support from key constituencies, especially government.
Recommendations for Further Study

The Bachelor of Technology degree marks a significant milestone in BCIT’s history. However, since the first mention of degree granting status for BCIT two decades ago, concerns have been voiced about the impact this would have on diploma programs. Opinion differed. Some believe the diploma would be enhanced; others suggested an adverse effect. A future study could investigate the impact of the Bachelor of Technology degree both on diploma programs and more generally on the overall culture of the institution. Studies could monitor educational parameters such as curriculum changes, and statistical data, for example enrolment trends. Longitudinal data could be compiled by including relevant questions on BCIT’s current student entrance survey.

A second research study could explore how creeping credentialism is affecting employer perception of the value of diploma programs. BCIT’s Institutional Research and Planning Unit indicate that some areas traditionally employing diploma-graduates are now favouring the “degree” credential, consequently hiring university graduates.

A third research study stems from personal interest. This current study has indicated that career/technical education in Canada has traditionally been regarded as “second best.” Societal attitudes and parental pressures for a degree credential have resulted in some students pursuing degree paths for which they are not well suited and others recycling through the system to obtain relevant work skills. This study suggests the Bachelor of Technology degree meets the dual objective of degree status and relevant work skills. A future study, compiled when the Bachelor of Technology has been in place for some years, could survey societal, specifically parental awareness and attitudes towards this degree. The objective would be to determine whether the prevailing shift in labour market demands for
more applied skills and knowledge coupled with youth unemployment, has influenced decisions or opinions on career/technical paths, or whether as literature indicates, change is constrained by tradition once again.

Summary

In conclusion, the legitimation of applied knowledge in British Columbia through the creation of a Bachelor of Technology degree at BCIT was an "event waiting to happen." On the one hand was a province looking to upgrade its workforce as it embraced a knowledge based economy; a province continually looking to improve access and equality of educational opportunity for its geographically dispersed population; a province exploring degree granting in the non-university sector. On the other hand was a provincial institution strategically well placed with its applied focus; with a proven track record and outstanding reputation in the business community; with a highly respected, energetic and committed faculty. A matured institution poised to take the next step in its evolution. The catalyst which sparked the convergence of these elements was the change in institutional leadership.
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In chronological order.

1960s


1970s


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BCIT, (1982). BCIT Response to the Committee to Examine the Extension of Technological Training at BCIT.


Thom, G. (1986). The Academic Role of the Extension Division


1990s


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Committee to Discuss the Expansion of the Role of BCIT, *Minutes of Meetings*, (1979)


**Secondary Sources**


Debling, G. & Behrman, B. Employability Skills for British Columbia.


References


References


References


288


Appendices
Appendix 1
### APPENDIX 1

**Abbreviations Used In the Study**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AECBC</td>
<td>Advanced Education Council of British Columbia.</td>
</tr>
<tr>
<td>BCHRDP</td>
<td>British Columbia Human Resource Development Project.</td>
</tr>
<tr>
<td>BCIT</td>
<td>British Columbia Institute of Technology.</td>
</tr>
<tr>
<td>BCLFDB</td>
<td>British Columbia Labour Force Development Board.</td>
</tr>
<tr>
<td>DES</td>
<td>Department of Education and Science.</td>
</tr>
<tr>
<td>MIT</td>
<td>Massachusetts Institute of Technology.</td>
</tr>
<tr>
<td>MAECD</td>
<td>Ministry of Advanced Education and Career Development. (Alberta).</td>
</tr>
<tr>
<td>MAEJT</td>
<td>Ministry of Advanced Education and Job Training.</td>
</tr>
<tr>
<td>MAETT</td>
<td>Ministry of Advanced Education, Training and Technology.</td>
</tr>
<tr>
<td>ME</td>
<td>Ministry of Education.</td>
</tr>
<tr>
<td>MET</td>
<td>Ministry of Education and Training (Ontario).</td>
</tr>
<tr>
<td>MEST</td>
<td>Ministry of Education, Skills and Training.</td>
</tr>
<tr>
<td>MSTL</td>
<td>Ministry of Skills, Training and Labour.</td>
</tr>
<tr>
<td>OLA</td>
<td>Open Learning Agency,</td>
</tr>
<tr>
<td>OLI</td>
<td>Open Learning Institute</td>
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</table>
Appendix 2
APPENDIX 2:

Alberta’s Eight Approved Applied Degree Programs

Eight applied degree programs were approved for the demonstration project, in seven of the public colleges and technical institutes. Four of the programs were implemented in September, 1995, with the remaining four implemented in the 1996-97 academic year.

<table>
<thead>
<tr>
<th>Institution(s):</th>
<th>Program Name:</th>
<th>Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grande Prairie</td>
<td>Bachelor of Applied Forest Resources Management</td>
<td>Sept. '95</td>
</tr>
<tr>
<td>SAIT</td>
<td>Bachelor of Applied Petroleum Engineering Technology</td>
<td>Sept. '95</td>
</tr>
<tr>
<td>Mount Royal</td>
<td>Bachelor of Applied Communications</td>
<td>Sept. '95</td>
</tr>
<tr>
<td>Mount Royal</td>
<td>Bachelor of Applied Small Business and Entrepreneurship</td>
<td>Sept. '95</td>
</tr>
<tr>
<td>Lakeland</td>
<td>Bachelor of Applied Integrated Environmental Management</td>
<td>Jan. '97</td>
</tr>
<tr>
<td>Lethbridge</td>
<td>Bachelor of Applied Conservation Enforcement</td>
<td>Sept. '96</td>
</tr>
<tr>
<td>NAIT/SAIT Jointly</td>
<td>Bachelor of Applied Information Systems Technology</td>
<td>Sept. '96</td>
</tr>
<tr>
<td>Olds</td>
<td>Bachelor of Applied Horticultural Technology</td>
<td>Sept. '96</td>
</tr>
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Appendix 3
APPENDIX 3B
List of Informants

Interview Participants

Birch, Dr. Daniel:  Vice President, Academic and Provost, University of British Columbia. Interview: October 7, 1996.

Briscall, Ms. Margaret: Faculty Member, BCIT; Former President of BCIT Staff Society. Interview: September 26, 1996.

Chowdhury, Dr. David:  Dean, School of Engineering Technology, BCIT. Interview: August 29, 1996.

Eisler, Dr. George:  Dean, School of Health Sciences, BCIT. Interview: July 26, 1996.


Harvey, Mr. Shell:  Assistant Deputy Minister, Ministry of Education, Skills and Training. Interview: August 30, 1996.

Leech, Mr. John:  Executive Director, Applied Science Technologists and Technicians, British Columbia; Former Member, Board of Governors, BCIT; Former Advisory Committee Member; Alumnus. Interview: August 15, 1996.


Newberry, Dr. Jack:  Former Director, Universities and Provincial Institutes. Interview: August 29, 1996.

Neylan, Ms. Margaret:  Former Associate Dean of Nursing, BCIT. Interview: July 25, 1996.


Powell, Mr. Wynne:  Senior Vice President and Chief Operating Officer, London Drugs; Former Chair, Board of Governors, BCIT; Former Advisory Committee Member; Alumnus. Interview: September 16, 1996.

Sheriff, Mr. Bill:  Faculty Member, BCIT; Former Member, Board of Governors, BCIT. Interview: September 24, 1996.
Simons, Mr. Tom: President, H.A. Simons Ltd.; Former Member, Board of Governors, BCIT; Former Advisory Committee Member. Interview: September 4, 1996.

Svetic, Mr. Drug: Former Vice President, Education, BCIT. Interview: October 7, 1996


Williamson, Mr. Rick: Vice President, Human Resources, Public Affairs and Legal, Chevron Canada Ltd.; Advisory Committee Member; Alumnus. Interview: October 10, 1996.
Appendix 3

APPENDIX 3E:
Permission Letter to Acknowledge Participant

1520 Woods Drive
North Vancouver
B.C. V7R-1A9
July 2 1997

Dear

Last Fall I interviewed you for the research project I was conducting as part of the requirements for the Master of Arts Degree in Higher Education. As the narrative of my study unfolds it is becoming increasingly difficult in some cases both to ensure a credible study by giving some indication of the level of authority of my information and to ensure the confidentiality I had indicated. Sources could be traced by linking them with the dates of events. I therefore ask that you give permission to be referred to by the position you held as indicated on the next page. Furthermore, I would very much like to acknowledge your participation in my study by name and title. You have already read the transcripts and I am happy to return these to you if you wish circling any quotations. Please fax the accompanying page back to me.

Sincerely

Ann McArthur.
APPENDIX 4
Table of Community Colleges

**BRITISH COLUMBIA'S COMMUNITY COLLEGES: ORIGINS**

<table>
<thead>
<tr>
<th>VOCATIONAL SCHOOL</th>
<th>TO</th>
</tr>
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<tbody>
<tr>
<td>BCVS Victoria</td>
<td>Camosun College</td>
</tr>
<tr>
<td>BCVS Nanaimo</td>
<td>Malaspina College</td>
</tr>
<tr>
<td>BCVS Kelowna</td>
<td>Okanagan College</td>
</tr>
<tr>
<td>BCVS Kamloops</td>
<td>Cariboo College</td>
</tr>
<tr>
<td>BCVS Prince George</td>
<td>College of New Caledonia</td>
</tr>
<tr>
<td>BCVS Terrace</td>
<td>Northwest Community College</td>
</tr>
<tr>
<td>BCVS Dawson Creek</td>
<td>Northern Lights College</td>
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<tr>
<td>BCVS Burnaby</td>
<td>Pacific Vocational Institute</td>
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<td>British Columbia Institute of Technology</td>
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<td>Vancouver Vocational Institute</td>
<td>Vancouver City College</td>
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<tr>
<td></td>
<td>Vancouver Community College</td>
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</table>

**COLLEGES (no pre-existing vocational schools)**

- Capilano College
- Douglas College
- College of the Rockies (previous name: East Kootenay College)
- Fraser Valley College

**BREAKAWAY COLLEGES**

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
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<tbody>
<tr>
<td>Douglas College</td>
<td>Kwantlen College *1981</td>
</tr>
<tr>
<td>Vancouver Community College</td>
<td>Langara College *1994</td>
</tr>
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</table>
Appendix 5
Skills Now Highlights

REAL SKILLS FOR THE REAL WORLD
Skills Now — the B.C. government's new skills training plan — will invest $200 million into four building blocks over the next two years:

• linking high school to the workplace
• opening more doors, and the right doors, to college and university
• retraining workers closer to home
• moving the unemployed from welfare to the workforce

New or expanded programs will be coming on stream over the coming months, while others will be further developed with the Skills Now partnership of business, labour, educators and communities.

LINKING HIGH SCHOOL TO THE WORKPLACE

• Increased work experience and apprenticeship preparation — almost doubling the number of students graduating with work experience to 50%.
• Issuing credits toward students' graduation for skills learned outside the school.
• awarding students post-secondary credits while attending high school, for completed courses in computer technology, electronics, forest science, business administration, and other fields.
• more high school graduates, through expanded stay-in-school initiatives, and alternate education programs

— such as storefront schools — to encourage drop-outs to complete their education.
• putting students on the information highway through a Provincial Learning Network, linking B.C.'s 1,600 public schools with colleges, universities and libraries.
• mandatory career planning by students.
• modernizing vocational and technical training to reflect the application of electronics and computers in all trades.

OPENING MORE DOORS, AND THE RIGHT DOORS, TO COLLEGE AND UNIVERSITY

• tripling new student spaces to 8,100 this year from 2,700 last year — including $12 million to challenge colleges and universities to find innovative, cost-effective ways to teach skills to more students.
• degree granting status for six colleges and institutes — including BCIT — plus the opening of the University of Northern British Columbia.
• improving access to post-secondary for students with disabilities, aboriginal students and single parents.
• six new advanced technology programs in growing job fields, such as environmental management, film animation, and computerized mapping.
• modernizing technical equipment with matching grants from business.

RETRAINING WORKERS CLOSER TO HOME

• labour force development through the Skills Now partnership to keep British Columbia on the leading edge of job training and retraining.
• the creation of 70 small business and 15 sectoral training programs — such as B.C.'s Forest Renewal Plan — to share the responsibility and cost of retraining workers.
• expanding and modernizing apprenticeship programs — creating 300 apprenticeships in new and growing fields.
• establishing 10 Community Skill Centres across B.C. — linked by telecommunication and computers — to provide closer-to-home training for up to 10,000 people.
• quick response training programs for communities affected by plant closures or expansions.

MOVING FROM WELFARE TO THE WORKFORCE

• individual training plans for 50,000 unemployed people.
• matching training to local job needs so people can stay and work in their own community.
• training credits for B.C. businesses of up to $10,000 for each new employee trained.
• targeted vocational and skills training at colleges and universities for up to 20,000 people.
APPENDIX 5B
Ministerial Announcement of Legislation

JAN 26 1995

Mr. G. Wynne Powell
Chair of the Board
British Columbia Institute of Technology
3700 Willingdon Avenue
Burnaby, British Columbia
V5G 3H2

Dear Mr. Powell:

I would like to advise that Bills 22 and 23, amending the College and Institute Act and the Institute of Technology Act respectively, have been brought into force by regulation of the Lieutenant Governor in Council, effective January 15, 1995. The principal aim of these amendments is: 1) to give university colleges and provincial institutes the power to grant baccalaureate and honorary degrees; 2) to include internal institution members on the boards of colleges, university colleges and institutes; and 3) to create an education council within each institution.

The Orders in Council approved, effective January 15, 1995, designate four university colleges, designate the baccalaureate and honorary degrees that the four university colleges and two provincial institutes may grant, and set the remuneration of appointed board members and elected student board members. Copies of these Orders in Council are attached.

Enabling university colleges and provincial institutes to grant baccalaureate degrees is an important element in accomplishing the goals of Skills Now - the Government’s initiative to prepare more British Columbians with the skills needed for jobs in a changing economy. Under Skills Now, six post-secondary institutions have been given a new mandate to grant degrees independently. These institutions are: Malaspina University-College, Okanagan University College, The University College of the Cariboo, The University College of the Fraser Valley, British Columbia Institute of Technology, and Emily Carr Institute of Art and Design. The degrees which these institutions may grant in their own names are set out in Order in Council 41/95.
As a result of the amendments contained in Bills 22 and 23, the College and Institute Act and the Institute of Technology Act now provide for the representation of internal institution members on the governing board of the institution (that is, one faculty member, two students, one support staff, the president and the chair of the education council). Such representation results in the implementation of a principle recommendation of the report of the Carter Committee on Governance in Colleges and Institutes, and recognizes the importance of the participation of faculty, students and staff in board decision-making. It is expected that such participation will contribute to board decision-making by increasing communication and collaboration between community board members and those who are most directly affected by board decisions.

In anticipation of Bills 22 and 23 being brought into force, and the change in composition of governing boards to include internal institution members, the Ministry was requested to draft Conflict of Interest Guidelines for board members. Extensive research was conducted and advice from experts on these matters was sought as the Ministry drafted these guidelines. The resulting guidelines were distributed to constituent organizations for comment, and a second draft prepared incorporating the constituent response to the greatest extent possible. The enclosed Statement of Guidelines for Serving as College and Institute Members of Boards has received general support from the constituent organizations. Boards are encouraged to adopt by-laws which represent the position taken in this statement and to submit them for approval within a reasonable period of time.

With respect to the remuneration of board members, the College and Institute Act and the Institute of Technology Act were amended to provide that the Lieutenant Governor in Council may set the remuneration that an institution pays to members of its board. This amendment complies with the recommendation of the Select Standing Committee on Public Accounts. Formerly, boards have set their own remuneration by bylaw, subject to the written approval of the Minister. Orders in Council 42/95 and 49/95 provide for government appointed members and elected student members to receive the amount of remuneration currently payable to appointed board members. The faculty and support staff members of the board will not receive remuneration. In order to provide for the full participation for institutional employees, it is expected that boards will schedule meetings with due consideration given to faculty members' teaching commitments and will encourage flexibility to permit support staff to attend meetings.

With the bringing into force of the amendments to the College and Institute Act and the Institute of Technology Act, each college, university college, and institute, except the Justice Institute of British Columbia, is required to establish an education council. Composed of elected faculty, students, and support staff as well as educational administrators appointed by the president of the institution, this body has an advisory role to the board in the development of educational policy, its own powers in specified matters, and joint authority with the board on articulation and other agreed matters. The creation of the education council, which was also recommended by the Carter Committee on Governance in Colleges and Institutes, will enable faculty, students, and support staff to participate formally and
APPENDIX 6B

Strengths, Weaknesses, Opportunities & Threats Analysis

Strengths

- Well defined Mandate.
- Recommendation for degree granting by Park Report (1987)
- Only institution totally committed to technological education in B.C.
- Success of Diploma program.
- Advanced Diploma in place and funded.
- Job ready graduates.
- Good relationship with industry.
- Recognition by industry.
- Co-op programs.
- High placement rates of graduates.
- Only source of post basic nursing specialities in B.C.
- Only centre in Western Canada for some programs.
- Largest retraining and upgrading centre in B.C.
- Infrastructure with advisory committees.
- Learning Resource Unit.
- Process of instruction encourages teamwork.
- Recognition of diploma by professional bodies.
- Relationship with Open University.
- Flexible delivery; Distance Education in place.
- Uniqueness of the degree.
- Curriculum is industry driven; retains currency.
- Faculty support.
- BCIT/Open University degree in place.
- Some bridging programs in place to universities.
- Industry linkages; Industry sponsored student projects.
(Appendix 6B — Cont’d)

- Highly qualified faculty with industry expertise.
- Technology Centre as vehicle for applied research.
- Ongoing Technology Transfer.
- Extensive computer facilities.
- High Tech. Equipment.

Weaknesses
- Fear of demise of diploma program.
- Faculty uncertainty.
- Fear of two strata of faculty.
- Faculty renewal.
- No Arts or Social Science Faculty to supply liberal education courses.
- Governance Structure: need peer participation.
- Cost of extra high tech. equipment.
- Governance structure of BCIT.
- Library resources.

Opportunities
- Changing technology; changing needs of industry.
- Predicted shortfall of science and technology graduates in B.C.
- Knowledge-based economy.
- Global economy.
- Need for integration of education and industry.
- Different skill sets required by employers.
- Demographic shift.
- Lifelong learning.
- Diploma graduate demand for career advancement.
(Appendix 6B — Cont’d)

• Society recognition of degree status.
• Decrease of skilled labour through immigration.
• Poor articulation with universities.
• Predicted increase of jobs requiring 4 years post-secondary education.
• Attract more faculty at the Masters and PhD. level.
• Student demand for defined connections between academic learning and vocational usefulness.
• Wealth creating.
• Education identified as key element in economic growth.
• Open University liaison.
• Void in the system; inappropriate recognition of technological skills.
• Increasing unemployment due to inappropriate skills.

Threats

• Diploma valued by external community.
• University College.
• Competition for resources in post-secondary system.
• Accreditation by AUCC.
• External validation using a university yardstick.
• Uniqueness of degree; comparison with university degree.
• Capital costs of high tech: equipment.
APPENDIX 6C

DISCUSSION ISSUES

Visit to the U.K. Polytechnics by BCIT Vice President, Education and Chair of Education Council: November 1991

The purpose of our visit to Great Britain is to gain a better understanding of the development of the Polytechnic, particularly as it gained the ability and credibility to grant a degree.

Several Issues

1. What were the factors that influenced your success during your transition to granting degrees?

2. How did you maintain a focus on the historical characteristics that made you a success prior to granting degrees?

3. What was the impact on those programs in your institution that did not lead to a degree?

4. Did you maintain as strong a relationship with industry after you granted degrees?

5. Do your programs have exit points for students enabling them to leave for employment with a recognized credential prior to achieving a degree and then return later for further study?

6. Do your degrees compete or complement the degrees from universities? How do they?

7. What was the impact on your institution as a result of granting degrees? What did it add? What did it subtract?

8. Did achieving degree granting status change the type of student attending your programs? If yes, how?

9. What is your governance structure with respect to academic affairs? What role does faculty play? What influence/role does industry have? What influence/role does government have?

10. Did you introduce an Applied R & D dimension with or as a result of granting degrees?
APPENDIX 6D
President's Letter Accompanying Proposal to Ministry

1992 July 15

Honourable Dr. Tom Perry
Minister of Advanced Education,
Training and Technology
Parliament Buildings
Victoria, B.C. V8V 1X4

Dear Minister:

Re: Bachelor of Technology Degree

The purpose of this letter and accompanying proposal is to request the Ministry's support for an amendment to both the University Act and the BCIT Act that would give BCIT the authority to grant a Degree of Technology.

Our submission is founded on the evolution of BCIT as an advanced technology institution with a proven track record in filling the needs of B.C. industry and business for highly skilled technicians and technologists. Today, BCIT offers rigorous diploma and certificate programs plus highly specialized advanced studies leading to an advanced diploma for students wishing to pursue career enhancement. Recently, BCIT established a collaborative program with Open University to allow BCIT graduates to complete degrees in certain areas of study.

The BCIT Technology Degree is a logical progression. It respects the needs of students for advanced training credentials that have universal recognition and value; it reflects the needs of industry for specialized team players capable of using newly developed technologies and processes; and it is targeted at selected Industry segments where the need is greatest and where it is recommended by BCIT Advisory Committees.

The attached proposal outlines the consultative process we adopted in building broad-based support for the technology degree and presents our case in considerable detail.

We hope you will give this proposal serious consideration and undertake the appropriate steps for enabling legislation. My colleagues and I would be pleased to discuss this with you at your convenience.

Yours sincerely,

John A. Watson
President

attachment
APPENDIX 6E
President’s Letter to Post-Secondary Institutions

Dear

In February 1991, I circulated a copy of a draft “Proposal for a Technology Degree at BCIT” for review and comment. We received some very constructive and positive feedback from various groups throughout the Province. Where feasible and practicable, we have incorporated the suggestions in our final proposal.

Our wide consultative process included a number of interested groups (post-secondary institutions, including universities, business, industry, various governmental bodies, as well as our internal constituents). We feel we are now in a position to carry forward our proposal to what we anticipate will be a successful conclusion.

I have enclosed a copy of the final May 1992 proposal for your information.

If you have any questions concerning the proposal please contact me.

Yours sincerely,

John Watson
President

JW/mc

Enclosure
APPENDIX 6F
President’s Letter to Minister of Advanced Education, Training & Technology

Honourable Dr. Tom Perry
Minister of Advanced Education,
Training and Technology
Parliament Buildings
Victoria, B.C. V8V 1X4

Dear Minister:

Re: Bachelor of Technology Degree

The purpose of this letter is to request your support for legislative amendments that will give BCIT the authority to grant a Technology Degree (the Bachelor of Technology or B.Tech). It is our understanding the Ministry will be considering degree granting status for a number of post secondary institutions over the next year or so.

Our submission is founded on the evolution of BCIT as an advanced technology institution with a proven track record in filling the needs in the B.C. workplace for highly skilled technicians and technologists. Today, BCIT offers students rigorous diploma and certificate programs for job readiness plus highly specialized advanced studies for career updating and enhancement. Recently, BCIT established a collaborative program with Open University to allow BCIT Diploma graduates to complete degrees in certain areas of study. While this bridging initiative fills the requirement of some students for higher value credentials in a flexible learning mode (and will continue to be useful to such students), we believe we must go beyond that model to meet the needs of students and employers for degrees that reflect the “job oriented” BCIT culture and provide expanded opportunities for recognition and laddering of existing credentials. The granting of the Bachelor of Technology Degree at BCIT is a progressive next step.

In preparing this proposal we followed a lengthy consultation process with BCIT students and staff, alumni, advisory committees, industry regulatory bodies, other post-secondary institutions in B.C. and government. Meanwhile, visits were made to a number of institutes in the UK, including four polytechnics. These discussions and visits provided valuable insight and encouragement, and led to the development of a formal “Proposal for a Technology Degree At BCIT”. This proposal has been reviewed by BCIT’s new Board of Governors and Educational Council (BCIT’s advisory group for educational matters) and has their endorsement. A copy is attached for your reference.

Office of the President

1992 October 14

British Columbia
Institute of Technology

3700 Willingdon Avenue,
Burnaby, British Columbia,
Canada V5G 3H2
Telephone (604) 432-8200
FAX (604) 434-6243
I am confident that the support we have received to date for the technology degree truly reflects the critical need that exists in British Columbia for technology training at this level.

Allow me to elaborate on why I believe such a degree from BCIT is needed at this time.

1. **Our students tell us this is so:** They value the BCIT two-year diploma for job readiness because their employment needs are immediate; for these students the BCIT diploma will continue to be the coveted job-entry credential. A growing number of graduates, however, appreciate that two years training, in some areas, is insufficient for highly skilled technology jobs and that advanced training and specialization are necessary for career progression. Moreover, they want the opportunity to combine their training with credentials that have universal recognition and value. They want the same opportunity to pursue and compete for high value career choices and the recognition that is given to University graduates. It is for these students the BCIT Technology Degree is specifically designed.

2. **Employers of BCIT graduates are saying very much the same thing:** Increasingly, companies are looking for highly-motivated team-players with strong communication skills, capable of using newly-developed technologies and processes. This is translating into an escalation of entry-level credentials as these companies look to their new employees to demonstrate this knowledge and skill following at least four years post secondary experience. This, in turn, has led to demands for diverse and flexible degree opportunities because in many instances the two-year diploma is no longer sufficient to give the technologist the depth of expertise.

3. **The social and economic fabric of the workplace is changing:** The notion that education is a once-in-a-lifetime experience is disappearing as individuals adapt, learn new skills and prepare for several careers. Companies are moving responsibility for decision-making down the organization, increasing the need for managers with multidisciplinary skills, especially team work and communications. As BC's leading institution for retraining and team experience, BCIT must provide an educational environment and a set of credentials that support this fundamental social and economic change. The certificate, diploma, advanced diploma and technology degree framework will provide British Columbians with an opportunity to alternate training and retraining with periods of employment, or to upgrade their credentials with part time courses while they are working.

4. **A BCIT degree will encourage greater participation in science and technology-based careers:** As British Columbia gradually shifts from a traditionally resource-based to a knowledge-based economy, science and technology will be vital contributors to sustainable economic development. Our Province's future prosperity will be influenced more and more by people who excel in math, science, applied technology and by skilled entrepreneurs, individuals whose skills enable them to transfer knowledge into practical
APPENDIX 6H

**Needs assessment**

- N.A. report
  - VP, Education accepts/rejects need for degree program

**Letter of Intent**

- Letter of Intent
  - School Panel: Accepts/recommends changes to Letter of Intent
  - Technology, Degree Committee: Accepts/recommends changes to Letter of Intent

**Degree Proposal**

- Degree Proposal
  - School Panel: Accepts/recommends changes to Degree Proposal
  - Technology, Degree Committee: Accepts/recommends changes to Degree Proposal
  - Degree Validation Panel: Accepts/recommends changes to Degree Proposal

**Degree validation process**

- Ministry: Provides feedback
- Other degree-granting institutions: Provide feedback

- Degree Proposal Review Committee: Recommends/rejects Degree Proposal
- Minister of Education: Approves/rejects recommendation
APPENDIX 61
News Release

For Immediate Release
May 3, 1994

"REAL SKILLS FOR THE REAL WORLD" TRAINING PLAN UNVEILED BY HARCOURT

VANCOUVER — A major, new skills training plan to give students, workers and the unemployed real skills for the real world, was unveiled today by Premier Mike Harcourt.

Harcourt said his government's plan — called Skills Now -- will invest $200 million over the next two years into creating or expanding more than 30 practical, innovative skills training and support programs for British Columbians.

“Our goal is to ensure British Columbians have the skills needed for new jobs in B.C.'s changing economy,” said Harcourt.

“With new industries and technologies emerging in B.C., our job is to make sure skills training keeps pace. Skills Now is a forward-looking plan that will increase access to the skills people need for our new and expanding job markets.

“Our plan will link high schools to the workplace, and increase access to college and university — so more young women and men keep ahead in our changing world. It will provide workers with the new skills they need for new jobs. And it will build on the strengths and abilities of the unemployed, to help them move back into the workforce.”

Harcourt said Skills Now is the result of a new partnership between government, business, labour, educators and communities, brought together last year at the Premier's Summit on Skills Development and Training. At today's news conference, the Premier was joined by B.C. Business Council President Jerry Lampert, B.C. Federation of Labour President Ken George, and BCIT President John Watson.

"Everyone has to do their part -- government can't do it alone," said Harcourt. "Skills Now brings together those who know what skills are needed in today's world of work with those who know how best to teach them."

Skills, Training and Labour Minister Dan Miller — who joined Harcourt in the announcement — said Skills Now will invest $200 million over two years into four building blocks:

- linking high school to the workplace — including increased work experience and apprenticeship preparation, graduation credits for skills learned outside the classroom, expanded stay-in-school programs, mandatory career planning by students, and modernized vocational and technical training.

....2
-2-

- opening more doors — and the right doors — to college and university — including tripling to 8,100 the new student spaces in colleges and universities, providing degree-granting status to six colleges and institutes, and creating at least six new advanced technology programs in growing fields such as film animation and environmental management.

- retraining workers closer to home — including establishing 10 Community Skill Centres across B.C. — linked by computers and telecommunications — to provide new skills training to 10,000 people, creating 300 apprenticeships in new and growing job fields, and developing 70 small business and 15 sectoral training partnerships — such as B.C.’s Forest Renewal Plan — to share the cost and responsibility of retraining workers.

- moving the unemployed from welfare to the workforce — including developing individual training plans for 50,000 unemployed British Columbians, providing training credits for B.C. businesses of up to $10,000 for each new employee trained, and matching skills training to the real jobs available in B.C.’s communities.

“Skills Now is going to make sure British Columbians have what it takes to get good, family-supporting jobs in our changing economy,” Miller said.

Miller added that, in each of the building blocks, new or expanded programs will be coming on stream over the coming months, while others will be further developed by the Skills Now partnership.

-30-

Contact:
Ministry of Skills, Training and Labour
Phone: 356-7274
Appendix 7
## UNIVERSITY GRADUATE ENROLMENT AT BCIT

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<th>School of Computing and Academic Studies</th>
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<tr>
<td>Total Students in School</td>
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<td>385</td>
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**SOURCE:** BCIT Facts and Figures (1995) and (1996)
APPENDIX 7B
Letter from Diploma Graduate: 1979

Feb. 16, 1979

Apt. 3 40 Delaware Ave.
Chatham, Ontario
N7L 2W2

Mr. D. J. Svetic
Vice Principal of Education
BCIT, 3700 Willingdon Ave.
Burnaby, B.C.
V5G 3H2

Dear Mr. Svetic,

For those of us who have graduated in one or other of the
technologies at BCIT and hope one day to continue our education,
this article (clipped from the Express) is most encouraging.

But I do take exception to a few points, and would like to
add some personal comments on others.
"Currently BCIT offers ... two-year diploma programs many
of which are transferable to other universities ..."

I know the words are the reporter's and not yours, but if
one is considering universities in Canada, the word should be "few"
not "many". And if she wanted to use the word "many", she should
have added "... but most of them seem to be in the U.S."!

For example, two years at a community college, with low
entrance requirements and courses which sometimes border on
entertainment, gives you two years standing at UBC. But two years
at BCIT in Mechanical Technology, with higher entrance requirements
and a course content at least 50% greater than a community college
(equal to at least 3 years of their education), earns only one year
credit if you want to go on in Engineering at UBC. Four more years
to go! Hardly a "transfer". More a "setback".

From my limited experience I seem to be finding that only
in U.S. technical universities is anything like full credit given for
work done at BCIT. Acquaintances of mine have gone on to Colorado
(for mining and civil engineering) and I have been considering
Michigan Technical U. to complete a degree in Mechanical.

To some extent, education at BCIT has been a dead end ...
nowhere to go but to start again! Because programs and philosophies
are so different (and some academic snobbishness is keeping the
institutions apart);I can't see any cooperative arrangement being
worked out with the traditional universities in Canada; so BCIT must,
as you intend, pursue its own objectives and develop its own accredited
degree program.
But it seems to me that whenever this subject is discussed two words recur: "Polytechnic" and "Ryerson". One seems to be a French concept (and France is hardly a European leader in engineering, technology, or the place of science in its society) and the other an Eastern Canadian model that has been a long time in developing and finding acceptance.

Isn't there something we can learn from U.S. models? How did MIT develop from a minor state technical school, overshadowed by the traditional status university across the river, to being one of the leading universities in the U.S.? How does Cal Tech in the West attract more top scientists than the University of California? How did obscure small town "mining" schools become recognized centres for graduate studies in certain fields... Butte, Colorado, Rolla, Michigan, Georgia Tech? The U.S. did not achieve world leadership in technology without having something to teach us about engineering education.

There are excellent models in other countries. The German "Technical Universities". Also the one that I have been considering for myself in Australia... The S.A. Institute of Technology, which in a generation has developed from a diploma granting institution to degree programs and even to graduate studies. (South Australia's position on the Australian confederation is not unlike B.C.'s in ours; and Adelaide with a population roughly comparable to Vancouver has two universities and S.A. Institute of Technology — a situation with certain similarities.

Anyway, it seems to me that the world has many models, more dynamic and successful than "Polytechnic" and "Ryerson", that might influence BCIT's program of development.

One word about the desirability of BCIT becoming a degree granting institution. I have heard it said (and some board members might share these sentiments) that the proper and only role for BCIT is job training for local labour requirements in two-year programs... that they should not spend their time and effort catering to some 10% of the students who might like to go on, that any expenditure of funds etc. should go to expanding programs at the lower level of needs.

I think this is nonsense. Would UBC seriously consider shutting down all graduate studies, discontinuing doctorate degrees, closing the Medical Faculty... all because these cater to only 1% to 5% of the student population? Should it concentrate exclusively on bachelors degrees for English majors in the Faculty of Arts just because this is where there is the greatest demand?
I think not. And this is because everybody in the institution benefits by improvement to its quality. The existence of a degree program at BCIT, even if only 5% of the students take advantage of it, benefits the whole institution by raising its standards and status.

I hope your efforts are successful. Put my name down for the first degree program in Mechanical.

And I also hope that if BCIT's new charter gives you the right to grant degrees, it also gives you the right (at some time in the future) to develop graduate programs, continuing education up to the Master's level. No need to be restricted in your vision.

My only reservations:

If this degree is given the orphan title of Bachelor of Technology or something equally anomalous in a world where "Science", "Applied Science", or "Engineering" is the accepted appellation;

If this degree is not accepted, totally; and without supplementary courses for graduate work in other universities in its particular field;

If this degree is not totally accepted as ranking with other universities' degrees by the charted professions (for entry, say, to P.Eng. courses), by the industry in their professional intake.

Then I, and the dozen more like me, are in danger of being led two more years up the same dead end path — a fate we could have avoided by finding more generally acceptable degrees — even those from lesser institutions outside the country.

Also it will be fatal to the future evolution of the academic status of BCIT if it feels that it has to adopt the posture, now, of a second class citizen in order to get acceptance of these plans without ruffling the academic feathers of UBC. I don't think Simon Fraser University felt it had to make this deference or concession to become established; and I am sure that MIT, Cal Tech, SAIT, and the other Engineering degree granting institutes of technology that I have mentioned above did not feel overwhelmed by their elder neighbouring, powerful and traditional universities. (some of which they, themselves, now overshadow)
SUPPLEMENTARY NOTES

Talking around the problem of "acceptance" with a friend from the personnel group of one of B.C.'s leading industrial companies with nation-wide and world-wide operations, this is the picture I get:—

There seem to be four status levels in his company's recruitment:

1. Executive level, which is handled above the personnel group, case by case.

2. Managerial and Professional level, which is handled by a "professional" personnel section which visits selected universities in recruiting new graduates and which processes applications (unsolicited or in reply to ads) from those holding degrees in science, engineering, etc. on a corporate basis. (Includes C.A.'s, commerce grads, etc.)

3. Technical, Clerical (some of which are unionized, some not) which is handled by a different and lower level personnel section where decisions are made more on a local or plant level (not corporate).

4. Hourly paid employees (all unionized) hired on a local basis by industrial relations people at the plants.

Despite much waffling, and statements like "it all depends" I was given to understand:—

A. All 4 year degree holders (Science, Ap.Sc., Engineering, even Commerce and Arts if required) are processed and given the courtesies of Status Level 2.

B. Technicians, including Technologists, BCIT diploma holders, etc., are handled by Status Level 3.

C. While they don't deliberately recruit at Ryerson, nor even visit it, any Ryerson graduate who happened to apply (even a 4 year degree holder) would be handled in the same way as a B.C. 2 year technologist, same as B above, at Status Level 3.

This, to me, is not "acceptance", despite what this same company might tell you.

What this tells me is that if I graduated from a four year program at, for example, Georgia Institute of Technology (B.Sc. or B.E.?)...
I would be given the corporate treatment as a professional; if I graduated from a program with the same (or even better, or more appropriate) technical content at British Columbia Institute of Technology (as a B.Tech) I would still be treated as a technician! And the status at induction largely determines future attitudes towards the individual and career paths in large corporations. Mobility between status levels is often minimal.

My informant would not be nailed down on this... but the impression was clear.

Should this not be taken into account in your plans to go the "Ryerson" or "Polytechnic" route, with B.Tech. as the degree conferred.

The Final Solution! Why not wrap this 4-year-degree-program into a "package" and sell it to S.F.U., to be run as a joint"school".

This would solve your problems with academic acceptance, and would give them what they sorely lack... an Engineering, or technical, faculty.

My other informant tells me that the South Australian Institute of Technology and the University of Adelaide ran their mining and metallurgy programs on this basis for many years before SAIT became a degree granting institution. In that situation the Institute granted a "Fellow" diploma, and the University an engineering degree (B.E.) for the same program of courses, provided that the student met the enrollment and general requirements in each institution. Two"degrees"!

A reason for checking out other models than "Ryerson"!
ULD GRANT DEGREES

BCIT seeks new role

By KARENN KRANGLE,

The B.C. Institute of Technology will become the province's fourth degree-granting institution if the provincial government approves a plan to expand its role.

The BCIT board of governors has endorsed a proposal that would change the institute into a polytechnic, similar to the Ryerson Polytechnic Institute in Toronto.

Institute officials say BCIT would be better equipped to serve local industry if its course offerings were expanded and some programs lengthened.

Currently, BCIT offers mainly two-year diploma programs, many of which are transferable to universities or other institutions.

BCIT vice-principal of education Drug Svetic, who prepared the proposal, said the institute wants to keep up with technological changes taking place in many industries.

"The institute, through the demands of industry and the accredited bodies we try to serve, has been trying to increase the length of its courses," he said in an interview. "It has been moving in a deliberate way toward a new and different role."

"We started to address the question about 16 or 17 months ago as to what BCIT could be doing beyond its diploma of technology."

Svetic said the education ministry also suggested some time ago that BCIT consider taking on a new role, although government officials have yet to respond to the polytechnic proposal.

"It seems one of the first decisions that has to be made is to provide the machinery for BCIT to offer bachelor of technology degrees," he said. "The next step after that is for us to get industry's support and our faculty's support."

"We would put emphasis on the high-technology graduates, like in the engineering areas, because there was a need for a diploma in technology, but now technology is moving along."

"Soon there will be a need for something more advanced than a diploma, but very different from an engineering degree," he said. "We will provide industry with high-quality technologists who have been trained to the degree level."

When BCIT was established about 15 years ago, he said, there was a need for courses that were more than college programs but different from university offerings.

Now, he said, areas such as chemical technology, mineral engineering and aquaculture need people with more than two years' training.

But Svetic said BCIT will continue to concentrate on the two-year programs, which have been successful in training students and placing them in jobs.

"The target would be something like 20 per cent of the student population 10 years from now would be on the bachelor's program, while the other 80 per cent would be on the two-year program," he said.

"The institute's main stream is still to remain a two-year, diploma-granting institution."

He added that each BCIT program will have to be studied in relation to industrial needs before it becomes a four-year degree course.

While the overall transformation period will be about 10 years, Svetic said, BCIT could be offering degree programs within a couple of years.

"One of the things Ryerson said to us is: 'Evolve slowly.' They got a new act and did it overnight," he said. "Although they're still behind their decision to go polytechnic, their advice is that we don't overturn everything immediately."

"At this stage, it's still a proposal on our part, and we haven't got any mandate. We are responding to a challenge, and whether or not we will meet that challenge, whether or not we are given that role — and we hope we are and think we can do it — is beyond our control."
January 26, 1994

Mr. John Watson
President
British Columbia Institute of Technology
3700 Willingdon Avenue
Burnaby, British Columbia
V5G 3H2

Dear Mr. Watson:

Thank you for your letter of November 23, 1993 and the other draft materials regarding technology degrees at the British Columbia Institute of Technology (BCIT). I apologize for the delay in my response.

First, I would like to commend you for the quality assurance review and approval process which has been developed. It is apparent that considerable effort has gone into development of the degree proposal framework and needs assessment.

The development of a proposal for a technology degree in computer software design at this time appears to be appropriate. With regard to a degree program in nursing, however, the Ministry is currently reviewing laddered nursing programs in the Province. In light of this review, it may not be timely to initiate a new nursing degree program in the fall of 1994. I would suggest that you either consider developing a single degree at this time or substitute one of the other possible programs for the nursing program.

The Ministry has made a request to Treasury Board for funding to address start-up and library costs for your degree programs. I will contact you in the near future for a more detailed assessment of your needs in this regard.

I trust that this information is helpful.

Yours sincerely,

Shell Harvey
Assistant Deputy Minister
Universities, Colleges and Institutes
APPENDIX 7D

KEY MESSAGES FOR GOVERNMENT

The BCIT Technology Degree:

- Increases the value society places on technical education comparable to that in place in Germany, England and Japan and, subsequently, presents new opportunities and options for B.C.'s labour force.

- Responds to the need for sustainable economic development, providing advanced levels of technical knowledge and a highly-trained workforce necessary for growth and development of new industries in B.C. (especially knowledge-based).

- Increases access to post-secondary education by providing a significant alternative to traditional university and university transfer programs, as well as bridging and laddering opportunities at various entry-points for diploma graduates.

- Provides a foundation for life-long learning through a highly flexible program delivery system with minimal disruption to the workplace.

- Meets the demands of business, industry and the workforce for the advanced skills required for companies and individuals to compete more effectively in local, national and global markets.

- Is totally unique. It recognizes technical education and work experience as essential prerequisites to program entry.

- Will be offered selectively to meet the needs of specific industry sectors.

- Provides advanced-level training for students in an institution whose expectations and practical, work-intensive culture they have already mastered.

1992 July 08

NH/jl
KEY MESSAGES FOR INDUSTRY

The BCIT Technology Degree:

- Is a degree developed with industry specifically to meet the human resource needs of industry and encourages industry to actively support the training of its employees (leading to more effective and efficient performance in local, national and world markets).

- Meets these needs in a convenient, flexible mode with minimal disruption to the employer.

- Enhances BCIT's highly-respected two year diploma as a mid-point credential for job-readiness and as a spring-board for career advancement. BCIT's diploma will continue to be an Institute cornerstone.

- Continues the successful tradition of education and practical training at the diploma level followed by immediate entry into the workforce.

- Increases the attractiveness of careers in science and technology for young people with an open-ended opportunity to advance their skills.

- Increases the attractiveness of BCIT for competent, highly qualified faculty.

- Will evolve as an advanced credential, focusing initially on those industry segments where the need is immediate.

Labour:

- Will offer the opportunity for tradespersons to ladder into the diploma/degree track.

1992 July 08

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