ACKNOWLEDGEMENTS:
To my family and friends, thank you.
To Jeanette and Dushko, thank you for the encouragement and guidance.

ABSTRACT
This project investigates the design of an urban school programmed using alternative modes of learning relevant to a knowledge driven society. The knowledge society, or knowledge economy, is a mode of thinking which is redefining established notions of knowledge. A knowledge driven society perceives knowledge as a significant resource and a key component in innovation. This understanding is important to education for it stimulates creativity and ingenuity. The shift sees knowledge being understood as a process. Within the discipline of education, “a knowledge society is really a learning society”. Learning becomes flexible and informal, where multiple disciplines overlap. Learning sees itself expand outside the boundaries of the school.

Technology is supplementary both to the knowledge economy and learning. It facilitates the ease of participation through easy information access and distribution. In education, it allows multimedia modes of learning supplementing traditional forms of communication. It questions the role of the classroom as the sole place for learning.

These issues have implications to the design of schools. Economy and efficiency have been the driving forces in the design of public schools, where the built form correlates with the industrial age mode of education still imbedded within the public system. The combination of shifting paradigms in education and ways of learning within the urban context provides the foundation from which to conduct this design project.

2 Ibid.
<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Part 1: Theoretical Background</td>
<td>8</td>
</tr>
<tr>
<td>Alternative School Models</td>
<td>17</td>
</tr>
<tr>
<td>Observations in Melbourne</td>
<td>21</td>
</tr>
<tr>
<td>Part 2: Defining the Project</td>
<td></td>
</tr>
<tr>
<td>The Programme</td>
<td>32</td>
</tr>
<tr>
<td>Site Particulars</td>
<td>35</td>
</tr>
<tr>
<td>Part 3: The Design Process</td>
<td></td>
</tr>
<tr>
<td>Design Concepts</td>
<td>48</td>
</tr>
<tr>
<td>Early Studies</td>
<td>52</td>
</tr>
<tr>
<td>Design Development</td>
<td></td>
</tr>
<tr>
<td>Exploration of the Permeable Edge</td>
<td>56</td>
</tr>
<tr>
<td>The Language of Projection</td>
<td>57</td>
</tr>
<tr>
<td>The Grid facilitating Permeability</td>
<td>61</td>
</tr>
<tr>
<td>Developing the Grid and Exchange Nodes</td>
<td>65</td>
</tr>
<tr>
<td>Focus on the Public Library</td>
<td>73</td>
</tr>
<tr>
<td>Interconnecting Circulation Loops</td>
<td>77</td>
</tr>
<tr>
<td>Assembling a Filter</td>
<td>79</td>
</tr>
<tr>
<td>Permeability, Flow, Exchange</td>
<td>81</td>
</tr>
<tr>
<td>Part 4: Conclusion</td>
<td>87</td>
</tr>
<tr>
<td>Future Directions</td>
<td>88</td>
</tr>
<tr>
<td>Bibliography</td>
<td></td>
</tr>
<tr>
<td>Appendix</td>
<td></td>
</tr>
<tr>
<td>Final Presentation Drawings</td>
<td></td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Fig. 1.1 Site aeria taken from Google Earth, and re-worked by the author.
Photo taken from: http://www.greenissexy.org/2007/10/31/november-spotlight/

Fig. 1.2: The Zoo School designed by Bruce A. Jilk.
Photo taken from: http://www.greenissexy.org/2007/10/31/november-spotlight/

Fig. 1.3: The Zoo School Plan of student 'houses'.

Fig 1.4: The Zoo School individual workstations.
Photo taken from: http://www.edutopia.org/school-environmental-studies-project-learning

Fig 1.5: The Zoo School collaborative spaces.
Photo taken from: http://www.edutopia.org/school-environmental-studies-project-learning

Fig 1.6: Melbourne Grammar School street façade.

Fig 1.7: Australian Centre for Moving Image foyer.

Fig 1.8: Flinders Lane, Melbourne.

Fig 1.9: Entrance of the Nigel Peck Learning and Leadership Building, Melbourne Grammar School

Fig 1.10: Circulation space

Fig 1.11: Entrance to the Nigel Peck Learning and Leadership Building from the street.

Fig 1.12: The building and playing fields.

Fig 1.13: Entrance to the library.

Fig 1.14: Melbourne Domain opposite Melbourne Grammar School

Fig 1.15: Street Facade Series

Fig 1.16: Entrance to Screen Worlds, ACMI

Fig 1.17: Entrance to Screen Worlds, ACMI

Fig 1.18: Material exploration of the "projected wall".

Fig 1.19: Screen Worlds, Kid's Space

Fig 1.20: State Library of Victoria, Melbourne

Fig 1.21: Federation Square, Melbourne

Fig 1.22: Urban Workshop, Melbourne

Fig 2.1: Site location

Fig 2.2: Site Analysis: Environmental Factors

Fig 2.3: Site Image Series: Grafton

Fig 2.4: Site Analysis Series: Networks

Fig 2.5: Site Particulars: 'new Newmarket' development replacing the Lion Brewery

Fig 2.6: Site Image Series: Existing Urban Flows

Fig 2.7: Analysis of Knowledge Flows: Now into the Future

Fig 3.1.1: Model: Edge explorations

Fig 3.1.2: Analysis Series: Edges and Access

Fig 3.1.3: Sketch Series: School circulation loop

Fig 3.1.4: Sketch Series: Public circulation loop

Fig 3.1.5: Bridging

Fig 3.1.6: Model explorations

Fig 3.1.7: Section of an early study

Fig 3.1.8: Sketch Series: School circulation loop

Fig 3.1.9: Sketch Series: Public circulation loop

Fig 3.1.10: Model Study: West Elevation

Fig 3.1.11: Model Study: Possible circulation spaces along the edges

Fig 3.1.12: Model Study: East Elevation

Fig 3.2.1: Model Study

Fig 3.2.2: Projection sketch

Fig 3.2.3: Projected model

Fig 3.2.4: Permeability studies: Access to the site through the centre

Fig 3.2.5: Plan

Fig 3.3.1: Model Study

Fig 3.3.2: Permeability studies: Beginning of grid and exchange nodes

Fig 3.3.3: Planning the school according to the grid and exchange node

Fig 3.3.4: Planning studies

Fig 3.4.1: Developing the site grid

Fig 3.4.2: Formal exploration using the language of projection

Fig 3.4.3: Master planning of the site

Fig 3.4.4: Defining exchange nodes using the grid

Fig 3.4.5: Model of the Library: Park Road Elevation

Fig 3.4.6: Exploring exchange nodes and intervening passages

Fig 3.4.7: Studying the permeable mesh

Fig 3.5.1: Model of the Library: Park Road Elevation

Fig 3.5.2: Exploring exchange nodes and intervening passages

Fig 3.5.3: Studying the permeable mesh

Fig 3.6.1: Exploration through site master planning

Fig 3.6.2: The school circulation

Fig 3.6.3: Public circulation loop interwining with schools circulation

Fig 3.7.1: Using an early model in generating an assembled surface/wall

Fig 3.7.2: The assembly

Fig 3.7.3: Sectional Model showing studio spaces relationship

Fig 3.8.1: Material exploration of the projected wall

Fig 3.8.2: Plans

Fig 3.8.3: Materiality Studies
INTRODUCTION

Schools are educational churches, and our gods, judging from the altars we build, are economy and efficiency. Hardly a nod is given to the spirit. 1  - Elliot W. Eisner

Schools are a significant social entity. Education is a universal right, essential in preparing the youth for the future. As it stands, standardization is still the primary principle underlying New Zealand's public education system. This is in line with a system of education representative of the industrial age mode of thinking, which could soon become unproductive. The knowledge society is now the framework by which a large aspect of everyday living is based on. It is a notion driven by creativity and ingenuity. 2 An education system obsessed with standardization will not serve a knowledge society. In a knowledge society, knowledge becomes a process that depends upon both individual and collective intelligence. 3 Multiplicity, diversity and connectivity are now the defining characteristics of work and learning organizations, influenced by this new understanding of knowledge. Linearity and uniformity influenced by the industrial age, production line mode of education is no longer enough to prepare the youth for the future.

4 Ibid.

Contemporary society is now becoming very open. Sophisticated technology has seen our modes of connection extend, unbounded by time and geographic location. Digital technology has paved the way for the era of hyper mobility. Because of this, our concepts of place and identity are being shifted to encompass the realm of the Internet, portable devices and computers. In education, the move to digitalization is enabling a number of great potentials and also dangers. The ease of access and distribution of information through digital technology becomes a tool enabling a participatory culture. Learning is no longer limited to what schools can provide.

The combination of knowledge society and digital technology have important implications to education. It requires a rethinking of educational paradigm. Multiple modes of learning are encouraged. Teachers have a pivotal role to play in these. Their work need to emphasise the cultivation of special capacities of their students and learn how to effectively work as networked professionals that have the ability to cope with change. 5

Alternative modes of education such as the Studio School in the United Kingdom, the Zoo School in United States and Da Vinci Schools are just the few initiatives for new ways of schooling. The emphasis in these schools is the individual learners, their ability to work in teams and cultivating the capacity for cross-disciplinary, project based learning. This is complimentary with the idea of knowledge as a process, whereby innovation through knowledge production is in practice. Such schools are often closely involved with the local community. The Studio School in particular has involvements from both public and private sectors, and it is through such exchanges that makes alternative schools possible. Their way of working fosters compassion and a sense of community through an active exchange with local place. This is the model by which this design project is premised.

The urban setting becomes the ideal platform to conduct this study. Given its diverse potentials, this is where the school as a site of exchange is best realised. It also brings interesting questions as to how the city becomes the extension of the school, and how this school’s presence in the urban setting challenges the power of mainstream education. Architecture has a critical role to play in envisioning how these alternative modes of education ought to be designed, for the built form becomes the embodiment of a school’s principles and culture.

Contemporary school design adheres to the practicalities of the school routine, security, discipline and classroom learning. Fences become the instinctive approach to implement security. However, this gated environment imprints the outlook of the school as an exclusive, institutional entity serving the need to instruct and discipline the youth to conformity. In line with the concepts of the learning society, can the school’s built form maximize the potential for exchange by allowing the existing urban system of flows to permeate and affect its spatial and social configurations? If so, what types of strategy need to operate in order to make the school a safe, yet open, place for learning? Such are the particulars that underlie many of the design decisions made throughout this study of what it means to be a school in an urban setting that is relevant according to the underlying fundamentals of what schooling and learning ought to be about.

**THE RESEARCH QUESTION**

How does an urban school manifest through its architecture our shifting understanding of knowledge and learning?
OBJECTIVES

I. Discover how a school should be architecturally defined and programmed according to changing definitions of knowledge and use of digital technology.

II. Construct a design system where a school becomes a place of exchange utilizing the potentials of the urban fabric.

DESIGN METHODOLOGY

This investigation, firstly establishes a theoretical understanding of the knowledge economy - what it is, its main drivers and its impact on education. Secondly, the school programme will actively interact with its urban setting.

The site selection and analysis are important steps in determining existing patterns and conditions the school will build from. The formation of design concepts is directly linked with how the urban setting influences the school.

The school programme will be defined. Alternative school models will form the basis of how this school will operate.

A rigorous process of analytical drawing and model-making, observations, diagrammatic illustrations and mapping will be undertaken to unravel relationships and patterns, leading to an architectural strategy.

A study of material will be undertaken to establish an architectural response that serves the purpose of manifesting the built form of these alternative school models.
PART 1.0  THEORETICAL BACKGROUND

Origins of New Zealand's Education System

The production line was the industrial age's key innovation. We can trace back New Zealand's current education system to this concept. Like factory workers, students are tested according to a set of standardized curriculum. Teaching is practiced according to the premise that everybody learns through the same methods and at the same pace. Tasks are set where the speed of completion is of the essence over the act of reflection and deep understanding. External assessment methods imprint the standardization of learning. School life follows the rhythm of routine and schedule. Conformity and respect for authority are the values emphasised by the system. This is the picture whereby the system's needs outweigh that of a student's. When a student fails to meet the system's standards, the student is deemed deficient, and not the system.

Influence of the Knowledge Economy in Education

Current understanding of knowledge is shifting and gaining new metaphors. Some theorists see it as a kind of energy, something that does things or make things happen. The postmodern philosopher Jean-Francois Lyotard projected a future in which knowledge is made significant according to its 'performativity' – its ability to do things. He does not see it as a set of universal truths, but rather an emergence of multiple forms of reasons and truths; the implications are that the line between disciplines will vanish.

Knowledge is now being understood as directly linked to economic development and performance. Knowledge has come to be understood as dynamic or fluid. Therefore, knowledge is a process, not an object, brought upon through interactions between people. According to organisations Castells has examined, knowledge becomes defined as a series of networks and flows.

2 ibid, p. 75.
3 ibid, p. 35.
4 ibid, p. 55 - 56.
5 ibid.
6 ibid.
The focus shifts towards the understanding of knowledge, as an activity. Developing a student's capacity for knowing in a variety of situations with different groups of people is now becoming the emphasis. Old notions of knowledge (knowledge as an end in itself) is still very important as raw material for knowing. They become "resources used in learning how to learn, and learning how to generate new knowledge." Jane Gilbert summarizes the core value of the knowledge economy when she states:

"The shift in emphasis from knowledge to knowing is important. Knowing is a process, whereas knowledge is a thing, knowing is a verb. It involves doing things and acting on things. It involves building relationships and connections. Unlike knowledge, it is not something that can be taken in and mastered. It has no end point, but is always on the way to something, always in process. Emphasizing knowing rather than knowledge allows us to redefine academic forms of knowledge with applied (or vocational) knowledge and to escape the intellectual blind alleys curriculum reformers inevitably find themselves in when they assume that these two forms of knowledge are naturally distinct. The distinction also allows us to think about education, particularly what we think it is for, in new and different ways, and to think in new ways about thinking, learning, and ability." 

Within organizations, the knowledge economy is characterized by flexibility and networking. A worker's ability to cope with change requires the cultivation of "fluid intelligence". "Fluid intelligence is specifically needed from teachers in order to effectively facilitate new modes of learning. Emmer calls it the activity of teaching," which is a critical component in the shift of paradigm in education. Globalization is linked with the knowledge economy. With innovation being its driving force, developed nations are aligning their policies according to the optimization of knowledge production in order to compete in the world stage. Critics of globalization and the knowledge economy suggest caution. They see the danger of this concept being inherently linked with the desire for profit and may only serve the private good, eroding resources from the state and public life. They do however see the great economic benefit this mode of thinking brings; therefore the challenge is to invest in improving social needs. This is where education plays a pivotal role. It is important that education instill a "set of values, dispositions and senses of global responsibility that extend beyond the bounds of the knowledge economy."
Youth, Digital Technology and Learning

Digital technology is a powerful tool that can effectively facilitate a knowledge economy. It enables the optimization of knowledge building. It does this through ease of access to information and its mass distribution. Being immersed in digital technology brings the youth in contact with convergent modes of communication characterized by multiplicity. The image and the screen become key elements, quickly emerging as primary devices in the delivery and acquisition of information. This extends old forms of literacy (writing, reading and arithmetic) to include the ability to operate a computer, navigate an interface, follow a link and read an image. The systems oriented notion of the knowledge economy has parallels to digital technology, for digitization operates under the same conditions of flows and connectivity.

Digital technology enables a mode of communication that is instantaneous, multi-layered, open to mass distribution and collective engagement. In a society where individuality can be easily extended to the realm of digital form, we can extrapolate from this that digital technology is the externalization of mental life.

In an article by Lev Manovich he explains the link between digital technology and human thinking as he states: "Mental processes of reflection, problem solving, memory and association are externalized, equated with following a link, moving to a new image, choosing a new scene or a text. In fact, the very principle of new media – links – objectifies the process of human thinking which involves connecting ideas, images, memories." Portable, electronic and networkable devices are now a form of extensions of ourselves. Access to information and its distribution is no longer bounded by time and space. This phenomenon has changed our understanding of place, and much more complex forms of personal identity are emerging. Multi-layered forms of communications are possible, and all these have impacts on the construct of the knowledge society.

New educational paradigms put the individual in the centre of learning. In a knowledge society, the synthesis of individual and collective intelligences is important. New educational paradigms put the individual in the centre of learning. In a knowledge society, the synthesis of individual and collective intelligences is important. In the context of learning the same thinking holds for alternative models of education. They assert the importance of collaboration and community. Digital technology is central to the management of collective intelligence and supplementing community networks. The relationship between education, knowledge and technology is best summarized in the following statement by Pierre Levy:

"Our living knowledge, skills and abilities are in the process of being recognized as the primary source of all other wealth. What then will our new communication tools be used for? The most socially useful goal will no doubt be to supply ourselves with the instruments for sharing our mental abilities in the construction of collective intelligences. The role of information technology and digital communications is not to 'replace mankind' but to promote the construction of intelligent communities in which our social and cognitive potential can be mutually developed and enhanced."
This study is guided by the premise that the emerging notions of knowledge economy require re-thinking of the current mainstream education system. The links between the knowledge economy and technology, and the urban condition demand a rethink of the school site. Contemporary modes of learning and instruction, led by sophisticated digital technology, question the classroom as the primary place for learning. The correlation between systems of flow and encounters is a natural characteristic of the urban condition. Therefore the city, in its diversity, becomes an important site selection for a school that wants to facilitate exchange.
The city is now home to a great majority of the population – 86% of New Zealand population lives in urban regions.\textsuperscript{22} It is important for emerging alternative schools such as the one proposed in this scheme to be noticed by the public. By being in a dense urban setting, alternative modes of learning begins to be acknowledged as an educational body that should not be hidden. They must sit side by side with mainstream education.

Perhaps, architecture can become the medium by which these types of schools get recognized. It imprints notions of diversity, innovation and change. It shows that we are able to embrace a shift of paradigm as we see fit in a highly complex globalized, networked society. In this context, the urban site is important not only to get noticed, but also to recognize the significant role that local knowledge and community plays in making alternative modes of learning function. According to existing models, these types of schools need the public sector and private institutions to work together to make a success out of these schools.

Also based on personal experience from art and architecture school, the Studio practice has much to contribute in implementing new ways of learning. Daniel Schön's notion of reflection-in-action as a mode of instruction and learning supports the idea of knowledge creation as an activity. The architectural studio where "traditions of education for reflection-in-action - for problem-setting, ad hoc theory-building, on-the-spot experimenting" becomes a precedent by which these alternative schools might learn. The notion of reflection-in-action as practiced by the studio master is an artistry in teaching that will become important in the conception of such schools.

The emergence of alternative schools is an important design issue for the following reasons:

1) the notion of the classroom as the sole learning environment is being challenged by curriculum changes and proliferation of computer technology;
2) the shift in paradigm means a change in ways of learning – the emphasis on teamwork, learning by doing and the teacher as a coach - need a re-think of how to spatially configure multiple elements that make up a school in order to accommodate this;
3) the role of the private sector and the local community is intimately involved in these types of school that its design must be open to the community.

The key message of the knowledge society is the need for education to focus on learning. Andy Hargreaves equates the knowledge society with the learning society. Schools must cultivate the culture of continuous innovation. This depends upon the capacity of a learner to keep learning and do so through interaction with others. Ideas of flexibility, networking and motivation are at the core of learning organizations. And these are the organizations according to Mark Carnoy that exemplify innovation through accumulated learning.

A number of alternative schools operate under such notions. They exist in a variety of modes all over the world. The Studio School initiated by the Young Foundation in the United Kingdom is one such example. The Zoo School is a similar initiative where partnership with the local zoo makes community involvement an integral ingredient in the curriculum. The Da Vinci Schools operate according to the ethos of learning by doing, a characteristic consistent in all three alternative models. These alternative models not only teach cognitive skills, but also instill the right attitude (collaboration, motivation and resilience) and social values (compassion and community) that educate students beyond the knowledge economy.

Alternative School Models

The key message of the knowledge society is the need for education to focus on learning. Andy Hargreaves equates the knowledge society with the learning society. Schools must cultivate the culture of continuous innovation. This depends upon the capacity of a learner to keep learning and do so through interaction with others. Ideas of flexibility, networking and motivation are at the core of learning organizations. And these are the organizations according to Mark Carnoy that exemplify innovation through accumulated learning.

A number of alternative schools operate under such notions. They exist in a variety of modes all over the world. The Studio School initiated by the Young Foundation in the United Kingdom is one such example. The Zoo School is a similar initiative where partnership with the local zoo makes community involvement an integral ingredient in the curriculum. The Da Vinci Schools operate according to the ethos of learning by doing, a characteristic consistent in all three alternative models. These alternative models not only teach cognitive skills, but also instill the right attitude (collaboration, motivation and resilience) and social values (compassion and community) that educate students beyond the knowledge economy.

The key message of the knowledge society is the need for education to focus on learning. Andy Hargreaves equates the knowledge society with the learning society. Schools must cultivate the culture of continuous innovation. This depends upon the capacity of a learner to keep learning and do so through interaction with others. Ideas of flexibility, networking and motivation are at the core of learning organizations. And these are the organizations according to Mark Carnoy that exemplify innovation through accumulated learning.

A number of alternative schools operate under such notions. They exist in a variety of modes all over the world. The Studio School initiated by the Young Foundation in the United Kingdom is one such example. The Zoo School is a similar initiative where partnership with the local zoo makes community involvement an integral ingredient in the curriculum. The Da Vinci Schools operate according to the ethos of learning by doing, a characteristic consistent in all three alternative models. These alternative models not only teach cognitive skills, but also instill the right attitude (collaboration, motivation and resilience) and social values (compassion and community) that educate students beyond the knowledge economy.
The school’s timetable is not subject-based, but rather organized in longer time periods (up to 3 hours). The core of this is to enable interdisciplinary teaching, while subject-based instruction happens on the side and is arranged as needed. The programme rejects the formality of bells or sirens commanding the actions of both teachers and students. It also rejects the formality of arranged classrooms according to subjects. This is a type of environment that is loose, open and dynamic.

**FNI Case Study**

**School of Environmental Studies**

**Apple Valley, Minnesota**

**Plan drawing by Randy Fielding**

**Architect: HGA**

**Planner: Bruce Jilk**

**Science Lab Advisor**

**Work Area Direct Instruction**

**Including Math and Language**

**Interdisciplinary Commons**

**Organization:**

The School of Environmental Studies (SES) includes four “houses” of 100 students each. Each house has a common area for interdisciplinary, project-based, and collaborative learning. Each House opens to a Science Lab, Advisor (Teacher) Work Area, and a classroom for direct instruction.

SES is a public school of choice open to 11th and 12th graders throughout the district. Each student has their own workstation with built-in personal storage and is part of a cluster or “Family” of ten students.

10-student Family

82 feet / 25 meters

59 feet / 18 meters

90.5 feet / 27.6 meters

Movable White Boards serve as Room Dividers

Passage to Three Additional Houses

Shared Storage

Individual student desk and storage

15.75 ft / 4.78 m

**The Zoo School in Minnesota.**

This school is defined for its interdisciplinary curriculum built upon a structured, open and self-directed learning. The school is designed according to a unique curriculum that fosters partnerships with outside industry, in this particular instance, the state zoo. Personalization is considered and conveyed in the school’s design of individual workstations. The school building, designed by architect Bruce A. Jilk, is broken according to the school’s organizational system of grouping students into “houses”. Furthering the personalization agenda, spaces are subdivided into pods to facilitate teams of teachers working with groups of students, with students given the opportunity to personalize their individual workstations. The furniture is customizable, decided by students’ and teachers’ preferred configurations.27

---

Observations in Melbourne

The trip to Melbourne became a major source of inspiration for this project. The original intention was to visit the Melbourne Grammar School, and study The Learning and Leadership Building designed by John Wardle. This building is in an urban location and has a number of parallels with my project. Also, the Australian Centre for the Moving Image (ACMI) was a good source for examining the technicalities of constructing a media heavy space – consisting of projectors, audio and interactive screens. Glimpses of Melbourne’s urban life and architecture showing qualities of permeability are also presented.

Fig 1.6: Melbourne Grammar School street façade.

Fig 1.7: Australian Centre for Moving Image foyer.

Fig 1.8: Flinders Lane, Melbourne.
The Nigel Peck Learning and Leadership Building, Melbourne Grammar School, designed by John Wardle:

This particular building has important features that parallel my project: 1) its urban location is similar for it sits along the fringes of the central CBD – close enough to experience its hustle and bustle but far enough to have some retreat from it; 2) adjacent to it is the Melbourne Domain; 3) in close proximity are a mixture of commercial, residential and civic facilities; 4) this building’s architectural language evokes ideas of openness; in relation to the existing built form of the Melbourne Grammar School, this addition stands out in its lightness and transparency (done mainly through the use of materials) and the building’s distinctive presence along the street.

Fig 1.9: Entrance of the Nigel Peck Learning and Leadership Building, Melbourne Grammar School
Fig 1.10: Circulation space
Fig 1.11: Entrance to the Nigel Peck Learning and Leadership Building from the street.
Fig 1.12: The building and playing fields.
Fig 1.13: Entrance to the library.
Inside the Federation Square building is a gallery that exhibits everything to do with film, digital media, animation and interactive media. The place is a popular hang-out for kids dropping by after school for a spot of computer games and to watch animation in many of the gallery's viewing pods. There are also a number of installations that are very interactive, such as responsive screens and recording installations. Architecturally, the place favours the exhibition over architectural expressions; however the technical requirements needed to make a media-heavy place such as this is quite significant. The space is an uncompromising installation of all the mechanical requirements - consisting of projectors, fans, ducts, spotlights, speakers. Architecture takes a backseat from screens, projections, screening pods, art installations and media exhibit. However, the sense of playfulness in some of these exhibits could be interesting when applied architecturally.
State Library of Victoria:

A major landmark and a place for congregation. This library houses a variety of uses - study, film screening, public seminars, retail and simply as a backdrop from which to watch urban life pass by. Teenage school students conduct surveys and observations of people here and in Federation Square, an activity which seems to be a norm as observed. It shows that a well connected, stimulating urban setting is conducive to learning. Schools should not be afraid in marking its place in the city. Conversely, the city should be considered a platform for productive learning.
Part 2.0  DEFINING THE PROJECT

The site chosen for the school is a defunct filling station in Grafton, Auckland bounded by the Auckland Domain on the north side of the site, in its heart is the Grafton Train Station. This urban setting will directly influence the programme.

The programme will be composed of the school, a public library, retail facilities and the train station. The school programme will house 250 students, age 14 -18, and 20 – 30 staff. The public library and the train station are important elements in allowing this school to be socially and spatially permeable by the community, facilitating exchange.

The School Programme

The project-base curriculum of the school takes the model of the Zoo School and Studio School. There are around 50 students in each studio year. Five large studio spaces have individual student workstations, located in two floor levels of the school. Each studio space is equipped with rooms dedicated for computer work. Presentation spaces are shared between studios and accessible within the same floor level. Teacher’s offices and seminar rooms are also provided in each level. An open space right by the entry lobby can function as an informal assembly hall and a bigger presentation space/gallery. These spaces will be located on the northern end of the site (along Carlton Gore Road). On the other end of the school (along Khyber Pass), houses a floor for special-ized subject instruction. This has laboratories, seminar rooms, teacher’s offices and a shared courtyard. An assembly hall is also located on this side and shared by the community. Workshops and more staff facilities are also located here. The school will also have, a rooftop garden with a kitchen, a gym (basketball courts & indoor pool), parking for staff, dedicated service lanes and building services room.
The Public Library:
This will house the following –
Clusters of reading Lounges
The Main Collection Floor
Multimedia Centre
Quiet study workstations
Kids Area
Self-service kiosks
The Librarian Helpdesk
Offices
Garden

Other spaces directly linked with the library are the following:
Community Learning Centre with dedicated After School Tutoring rooms
Waiting Courtyard
Retail Space

This programme is made very accessible to the public, with foot traffic increased because of access to the train station. A slight addition to the existing access to the train station will provide a shortcut to the platforms.
Site Particulars

The location of the school opens the project to a number of great urban ideals, such as accessibility, diversity, encounters and interaction; however this makes the need for security an important consideration. The school will occupy a 200 x 60 metre site, with a proposal to build according to the following guidelines:

- The south-eastern boundary of the site (now the defunct Lion Brewery site) is zoned Business 4 with height restrictions of 15 metres.
- The north-eastern boundary of the site is zoned Residential 7B with height restrictions of 12.5 metres.
- Introduction of a new access route (shortcut) to the train station and platforms that allows public passage through the school.
- There is a 16 m drop on the site's topography.
Outlined below are the key factors that are influential to my response to the brief and this study’s premise:

I. The neighbouring western blocks are zoned for residential use, while Newmarket is a bustling hub of industrial, commercial and retail facilities – ranging from upmarket showrooms, fashion houses, cinemas, restaurants, bars and recreational facilities (gym and pool). The diversity of activities and facilities (residential, educational, commercial, corporate, civic and recreational) in close proximity to the site suggests a great mix of people will be in contact with the proposed school; therefore, the architectural scheme and school programme should capitalize on this diverse and rich urban framework and cater for this diversity.

II. At the heart of the chosen site is a main transportation node – the Grafton Train Station servicing Auckland CBD, through the western and eastern suburbs. The school is accessible to prospective students outside of the immediate locality.
III. An interesting combination of a large park (The Auckland Domain), a small, intimate park (Outhwaite Park), and the train station. The site has both the restorative and the gritty characteristics of the urban setting.

IV. The now defunct Lion Brewery site is under proposal to be developed into a mixed-use urban village, making the site denser and more diverse in the future. This presents the scheme with the need for a permeable architecture where diversity is absorbed by the school. Formal and compositional spatial strategies can maximize the potential for exchange. The school proposes a type of learning open to the richness and energy of urban living – and will attempt an architecture that does not exclusively belong to an institution but welcomes the wider urban community.

V. The important loop of established schools in close proximity to the site.
The following factors generated the design concepts:

Site defined according to edges: This has a twofold definition: 1) the site sits on two urban edges (boundary), that of Auckland CBD, the other of Newmarket; making it a critical junction; and 2) within the site are a number of distinctive edges consisting of the train station, the Lion Brewery (speculated to become a mixed use urban village), Park Road, Auckland Domain (Carlton Gore Road), and Khyber Pass Road.

Site as a location of multiple nodes (transport, educational, industrial and civic): The site as a patchwork of possibilities and potentials conducive to various forms of facilitating exchange.

Fig 2.5: Site Edge Conditions

Fig 2.6: Site Analysis Series: Networks
The Learning Network: The link with existing educational bodies (St. Peter’s College, Auckland Grammar School and Auckland University Grafton campus) puts my scheme on a very ideal and fitting location to allow shared facilities and exchange between schools.

The proposal of a mixed-use urban village ("new Newmarket"), will make the site more dense in the future. The idea of introducing permeability into the site is largely influenced by this potential.

Through these, ideas of permeability, flow and exchange were generated.

Fig 2.7: Site Particulars: ‘new Newmarket’ development replacing the Lion Brewery

Fig 2.8: Site Analysis Series: Existing Urban Flows

FLOW ANALYSIS

1. PEDESTRIAN: undirected in the park; intense in Newmarket, linear along the roads
2. VEHICLE: uncompromising
3. KNOWLEDGE: two defined by university and high schools district
4. VIEWS: squares denotes the urban; circles denotes nature

Fig 2.9: Site Analysis Series: Existing Urban Flows
Fig 2.8.1: Analysis of flow changes: Concentrating in the middle of the site due to new Newmarket development.
Design Concepts

Envisioned as a school that externalizes the idea of knowledge production and exchange, the architectural strategies try to achieve the following:

1. Permeability
2. Filtering flow
3. Exchange

To outline the methodology clearly, it can be broken down to:

- Site-specific Study: The City as the School
  One of the most defining characteristics of the site is the diversity of conditions. The link between education, knowledge economy and the city forms a system that could redefine what it is to be a school. How the school interfaces with its distinctive edge conditions is a critical design driver.

- Permeability + Interface: Filtering
  The goal is to construct a permeable, yet secure urban school while filtering flows (pedestrian, transport, views, climate conditions, etc.). The grid plays an active role in facilitating permeability. The speculated future flows influenced the need to re-focus permeability within the site rather than its periphery, (as described by Fig 2.8.1). The interface also is crucial in catching the flow of people.

- Activation and Exchange
  Projection - used in terms of mirroring and transfer - generated ways of composing a formal language. The composition of the school manifested ideas of fluidity and flow. Combined with the development of the grid, nodes became crucial in determining spatial configurations around it to enable exchange, guided by permeability and filtering.
ANALYSIS OF KNOWLEDGE FLOWS:
Present to the Future

Pink boxes indicating current sites of knowledge.

Connected flow of sites of learning through the addition of a new school.

Extended sites for knowledge, including the university, St. Peter’s College, Auckland Grammar School, the hospital, the Domain, Museum, Wintergardens, and neighbouring industrial and commercial entities.

Since the rich urban character of the site becomes a defining factor in the school’s programme, the actual site of learning becomes somewhat blurred. A school envisioned to make learning fun and engaging could capitalize on its urban setting. Collaborative programmes with the park, the museum, the university and local businesses see the site of learning expand outside the physical boundaries of the built form of the school. How should this line of thinking be expressed formally and spatially?

The City as a School
EARLY STUDIES:

This was a very early study where the focus was to intertwine the school with a type of "bridge", housing public-oriented functions along the north-south axis of the site. This exploration was an intuitive attempt to construct a formal language that was directly influenced by the site. This study happened during a stage where speculations regarding the Lion Brewery were not yet established. This made the school's interaction along Park Road the main emphasis. The study unravelled the importance of the site-edges for my project. This early exploration became one of the critical moves that directed the formal investigation towards the study of edges and interfaces (walls, façade, skin).

Fig 3.1.5: Bridging

Fig 3.1.5: Model - Edge explorations
The dotted periphery indicates the flow of pedestrians around the site.

Yellow lines indicate a potential circulation system decided according to the site boundaries.

The orange squares mark potential entrances into the site.

During the early stages I decided to keep the existing buildings and chose the boundary of the site accordingly (as indicated here in black).

Fig 3.1: Analysis Series: Edges and Access

Fig 3.2: Sketch Series: School circulation loop

Fig 3.3: Sketch Series: Public circulation loop

Fig 3.4: Model explorations
3.1 Exploration of the Permeable Edge

The western edge (Park Road) is very vehicle oriented, therefore massive, uninterrupted walls face this western edge. It addresses the practical need for protection against noise, pollution and the vehicle. This horizontal face opens up when there is a need to provide access to the site at certain locations.

We can read this move in two ways: 1) a horizontal, blank face is a direct response to the walling of Outhwaite Park at street level – alongside a busy traffic intersection. Under this condition, street life is difficult to facilitate. This led to 2) shifting the emphasis towards the new Newmarket redevelopment.

A series of alternative spatial configurations proposed the school's functional requirements along a spine. A series of alternative massing configurations assessed the creation of open spaces on site. (Refer to Appendix)

Fig 3.1: Sketches of Model 2 Studies

Fig 3.1: Model 2 Explorations: Cut and Bend
3.2 The Language of Projection

projection: to transfer, to mirror, to extend outwards

This became a method for formal and compositional investigation. The method of projected forms introduced the scheme to bringing flow through the middle of the site rather than along the periphery. It was at this stage that the library could potentially be the main attraction inviting the public in. Supported by a shortcut to the train station, pedestrian flow is increased through the site of the school.

Fig 3.2.1: Model study
Fig 3.2.2: Projection sketch
Fig 3.2.3: Projected model
It was also at this stage that the need for a safe yet open school environment emerged. The objective is to achieve a reasonable level of security without the need for fences and impenetrable walls enclosing the school. As shown by the diagrammatic plan (Fig. 3.2.6) a bridge that is only accessible to the school became an alternative. Visual connection is maintained between the street, railway and the bridge through a transparent and mesh-like material. This became one method of filtering the school flow (above ground) from the public flow.
3.3 The Grid facilitating Permeability.

A shortcut to the train station through the middle of the site was created. The introduction of spatial voids - organized around gathering spaces (school gym, assembly hall, kitchens, teacher’s seminar rooms, the library (Fig 3.3.4). This enabled visual and social connections to occur between the school and the public - beginnings of formulating exchange nodes.

This study also revealed how the grid is critical in constructing a system of permeability, through straightforward passages. As the grid developed, the importance of the west-east axis became apparent. This design move directly engages the school with the neighbouring community, introducing street-life in the heart of the site and not just along the site’s periphery.
The function-based exploration attempted in this model temporarily abandoned the earlier studies made, where site edges and faces were the primary focus. The school’s spatial and social relationship with new Newmarket are stronger if outdoor spaces (courtyards) are situated in order to be shared between them. Also, by bringing the building closer along the edge Park Road, the busy Khyber Pass junction is accentuated, an important move for it acts as a pivot for between the school and the neighbouring schools.
3.4 Developing the Grid and Exchange Nodes

The grid system is crucial in a number of ways. A straightforward grid optimizes permeability through the site. The correlation between the grid and exchange nodes formed a system of choreographing exchanges between the public and the school. These nodes of exchange can accommodate a variety of function – retail spaces, display galleries, informal meeting places, and common rooms.

Permeability is no longer concentrated just in the middle of the site but dispersed parallel to the railway tracks and creates a strong east-west connection. This is in response to making a stronger relationship with the train station and also the new Newmarket redevelopment.

The creation of the street does not happen on the periphery of the site but across the school and the new Newmarket development. The east-west axis of the grid acknowledges the potentials of the railway as an energetic point of exchange between the public and the school.
As indicated on the diagram, the creation of the inner street forms connections to the Auckland Domain and the train station. The relationship between these two diverse conditions is stronger and makes for a dynamic urban environment along the periphery of school grounds. This also allows for the development of well-defined outdoor spaces to be shared between the library, school and locals in neighbouring urban villages. The language of projection was also revisited in this study through projecting these L-shaped forms.

Two overlapping L-shaped volumes house the school separate from the public library and research centre. These two volumes become united by a triangular atrium where collective functions (such as assembly halls, eating hall, retail, school workshops, school commons, entrance lobbies) are designed around this space – maintaining visual connections between a number of different activities. In this study, the formation of exchange nodes was guided by how the L-shaped volumes overlap with the train station and the inner street, as illustrated. Exchange nodes occur along the Park Road periphery, to catch the flow of pedestrians coming from university, hospital and the Domain.

The east-west axis at this stage was being developed to enable permeability towards the direction of new Newmarket, and along the railway tracks. This implies that future developments could follow the grid shown here, guiding the formulation of future streets (or laneways) that run both inside these future communities and along the current boundaries. Also, the formation of alternative exchange nodes developed according to this east-west axis grid.

Fig 3.4.5: Master planning of the site

Fig 3.4.6: Defining exchange nodes using the grid
3.5 Focus on the Public Library

The focus on designing the library tested other ways of 1) determining permeability into the site and 2) establishing the school programme in relation to the functions of the library. The emphasis on the library enhances public engagement with the school. This makes the school an open, collective platform of public exchange – as a place for knowledge resource and creation. The school becomes exposed to a diverse group of people that begins to inhabit shared spaces within the site. An open, porous condition presented here enhances the student’s understanding of the urban fabric that makes their place of learning a stimulating place to be. This engages the youth in a mode of learning that is authentic – placing learning within the realities of the urban condition and the wonders of circumstantial events it initiates.
The introduction of the mesh became a manifestation of permeability. Gathering spaces are designed around the vertical element which also acts as an anchor. This distinctive architectural device, acts to absorb users. Through programme, this anchor and the spaces around it are activated. Moreover, this device not only absorbs but also acts as a filter – primarily through its operation as a means for vertical separation between the school and library programmes. The addition of the mesh (bridge/street) begins to manifest filtering flows.

Fig 3.5.3: Studying the permeable mesh.
3.6 Interconnecting Circulation Loops

The notion of permeability manifests itself according to the interaction of the school loop with the public loop; however, this failed to establish a clear strategy on how to contain the flow. A strategy was needed to filter the flow in order to choreograph exchanges between the school and the public. The mesh materialized the unity between the library and the school, unlike in earlier schemes where the mesh formed the envelope only for the school.

Fig 3.6.1: Exploration through site master planning

Fig 3.6.2: The school circulation

Fig 3.6.3: Public circulation loop intertwining with school’s circulation
3.7 Assembling a Filter

This study revisits an earlier model exploring the idea of the permeable surface. By isolating the element where the cut and bend happens, the “projected” (mirroring and transfer) assembly of surfaces developed. The indentation allows for informal, mini-workstations to form. A place for rest and separation. It creates space that filters flow of movement. If used as partitions or as a building envelope, it filters light and visual connection between private and public. It has potentials to allow several uses, such as shading device, storage, partitions and building envelopes.
3.8 Permeability, Flow, Exchange:

The grid was a strategy to enable permeability through the school and construct exchange nodes (places where people congregate, mingle and allow different modes of activity to happen). The idea of projection was once again used in the formation of the assembly of "projected wall" that filters public from private. It also became the basis of defining studio spaces for collaborative working.

The following series of plans show major circulation spaces being located at exchange nodes, increasing visual connections and enabling exchange at certain points where different programmes converge (Fig. 3.8.2). Along the periphery of the school are the assembled "projected surfaces", primarily as a device to filter light and visual connections. The assembly also formed informal mini-media centres (computer workstations) in the school and public library. Indentations on these surfaces define informal spaces in which people can rest or sit down and watch the outside life pass by in privacy. The assembly is still being refined by experimenting with material and construction methods.

Fig. 3.8.1: Material exploration of the "projected wall."
Fig 3.8.2: Plans.
Fig. 3.8.3: Materiality Studies
The formulation of the grid and the assembly of the "projected walls", facilitated permeability and filtering of flow within the school. Permeability was achieved through straightforward passages (internal streets) as configured according to the development of the grid. Combined with the school's spatial configuration, exchange nodes were created that interfaced the school with the public through the library and train station shortcut. Shared facilities allowed exchange with neighbouring schools, inviting them to extend their sites of learning beyond their fences.

The filtering of flow was devised according to the use of the projected walls, which controlled visual connection through layering of surfaces. It was also a device that defined function – for example, a specific assembly enabled the space to become a workstation, while another as a window/wall controlling light and visual connection between private and public.

Elliot W. Eisner talk about three different curriculums that all schools teach - explicit, implicit, and null curriculum. The way a school is designed, and the environment that results from it is a form of implicit curriculum. It develops attitudes and dispositions important in the development of the youth. Well-designed alternative, open schools that recognize its place in the city is a mark of acknowledging a society open for change. Having alternative schools sit alongside mainstream school imprints the notions of diversity and individuality. It seems to me that this becomes an important ingredient in a knowledge society that must cultivate continuous learning in its young citizens, but also to its adult cohorts. Community plays an important role to this. A school (along with a project based curriculum) well integrated with its context imprints the notion of authentic – was seen – learning, and develop motivation, resilience, curiosity and empowerment. Attitude, particularly motivation, is now becoming just as important as the development of cognitive skills. Schools and the way they are designed facilitate how engaged they would like to be with the neighbourhood. Fences surely create a sense of security, but also limit the potential for meaningful community engagement. An obsession for security makes for an "imprisoned" type learning environment. Becoming a permeable place for learning, communicates a sense of trust to the community, which is one of the first steps in making meaningful exchanges. Likewise, society puts a lot of trust in schools in cultivating the right values and knowledge to young citizens who will lead us to the future. The quality of spaces designed for learning must impact the right attitudes and values. Openness, being the primary step to connection is crucial to learning, and through connection, individuals find a sense of belonging.

FUTURE DIRECTIONS

This design strategies devised in this project addressed the primary objectives of creating a permeable, open school within the urban setting. These strategies have also been sufficient in the exploration of architectural form, composition and spatial configurations. One potential test will be to design these alternative schools in a site with completely different conditions, for example in a purely suburban context or in a rural setting. It will be interesting to see what kind of strategies a different site could bring using the same programme. What sort of values or attitudes would the school try to manifest architecturally under a different site condition?

PART 4.0 CONCLUSION

The design strategies devised in this project addressed the primary objectives of creating a permeable, open school within the urban setting. These strategies have also been sufficient in the exploration of architectural form, composition and spatial configurations. One potential test will be to design these alternative schools in a site with completely different conditions, for example in a purely suburban context or in a rural setting. It will be interesting to see what kind of strategies a different site could bring using the same programme. What sort of values or attitudes would the school try to manifest architecturally under a different site condition?

APPENDIX

Fig 3.1.18: Series of Spatial Configurations

Fig 3.1.19: Series of Site Massing
FINAL PRESENTATION DRAWINGS
FINAL PRESENTATION DRAWINGS

i. 3D model (elevation).
ii. 3D model rendering.
iii. site analysis.
iv. perspective.
v. perspective.
vi. site plan.
vii. arrangement of programme.
viii. plans.
ix. long section.
x. programme schematic.
xii. perspective (library entrance).
xiii. perspective (library - urban lounge).
xiv. perspective (library from school corridors).
xv. perspective (school commons).
xvi. perspective (media room).
xvii. perspective (school commons).
xviii. perspective (classrooms + commons).
xix. study models.
xx. 3D model wireframe.
FINAL DRAWINGS.

- 3D model rendering
- Site analysis
OPEN SCHOOL: Learning + Exchange in the City.

FINAL DRAWINGS.
vi. site plan.
vii. arrangement of programme.
OPEN SCHOOL: Learning + Exchange in the City.

xiii. perspective (library - urban lounge).
xiv. perspective (library from school corridors).
xv. perspective (school commons).
xvi. perspective (media room).
xvii. perspective (school commons).
xviii. perspective (classrooms + commons).
xxi. study models.
xx. 3D model wireframe.