

The Teacher-IT Worker Relationship:
A Case Study of a Singapore International Private School

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Doctor of Education
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by

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Declaration

This thesis is my own work and no part of it has been submitted for a degree at this or any other university.

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2010 October 30

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Abstract

As schools use more technology, they are increasingly likely to hire in-house IT support workers. Nothing is known, however, about relationships between teachers and IT workers. This study examines the perceptions of relationships between these occupational groups at an international private school in Singapore. As an international private school, the research venue is self-governed and self-funded. This autonomy allows the school to establish its own hiring practices and management structures devoid of the political interference and delayed responses that might characterise a larger-scale school system.

A review of the literature reveals three themes: perceptions of professional status, perceptions of occupational prestige, and perceptions of occupational cultures – each subsequently investigated in terms of the relationships fostered between the two occupational groups. Twelve teachers and seven IT workers participated in detailed semi-structured interviews – which were then subjected to qualitative analysis using both open and axial coding.

The research findings show that extant literature on each individual occupation is largely validated. Relationships between the two occupations were generally regarded as good, with each side reporting sources of minor irritation with the other. These irritants included exploitation by teachers and lack of prompt service from IT workers.

Additional findings include:

- Two forms of inter-occupational ambassador exist: the *tweeners*, whose jobs place them at an intersection between the two groups; and *bridgers*, who voluntarily seek to strengthen interactions with their occupational counterparts.
- Teachers uniformly but sometimes hesitantly claim professional status. IT workers generally deny having professional status on the grounds that they lack complete mastery over their field of work.
- Other important elements of relationships include secretaries, communication, occupational cultures, and the geography of offices.

The study concludes with suggestions for future research and recommendations for schools to improve relationships between teachers and IT workers.

Keywords: relationships, technology, teachers, IT workers, communication

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I am deeply indebted to Professor Clive Dimmock. I could not have asked for a better supervisor. His patience, expertise, and counsel made all the difference.

*This dissertation is humbly presented in honour of my father
Professor Abram Johann Friesen
who always sought the left hand of God
where he would find the quest for answers
rather than the answers themselves.*

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Colophon

Body text was set in Adobe Garamond Pro; table and figure titles were set in Gill Sans. Illustrations were created in Omnigraffle and Apple Numbers; layout was in Adobe InDesign.

Footnotes are set at the bottoms of pages to improve reading flow. Spelling is UK English except within quotations from US English sources. Punctuation and referencing are “hackish” (Raymond 2010); tables and graphs are “Tuftian” (Tufte 1992).

This layout has been ‘tuned’ slightly for electronic delivery, eliminating left/right variations in margins and page numbers. However, the flow of text is best suited to viewing two-page spreads, hence page 116. The table of contents and the list of figures and tables have been hyperlinked to their page targets.

Surprisingly, perhaps, knowledge about occupational groups within academia is relatively scant, with an almost exclusive concentration upon teaching staff.

(Collinson 2006: 267)

Chapter 1. Statement of the Problem

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1.1 Introduction

In the late 1990s, I was the Technology Coordinator at an international private school in Southeast Asia, and in this role I straddled the worlds of the teacher and the IT worker¹. My headmaster once looked into my office, shook his head, and said, “I’ve never seen an IT guy with a clean desk.”

That observation implied an occupational distinction, differentiating two groups of people working at different tasks in the same organisation. If their areas of activity were clearly demarcated and they weren’t forced to interact with each other, then any differences between them would be less important. However, they do interact, and they presumably share a common mission.

Judging by the literature, little is known about what happens in a school when a new occupational group enters the traditionally mono-professional realm of the teacher. This is particularly true when the newcomers might have substantial levels of post-secondary training and a potential claim to professional status. Do teachers² and IT work-

1 The literature is ambiguous regarding the formal designation of these employees. Although “IT worker” dominates, “IT staff” is also common. Compounds with “ICT” are rare. “Technician” does not adequately discriminate functions.

2 Syntax: In this paper, the terms “teaching faculty” and “teachers” are used interchangeably.

ers recognise the professional status and occupational prestige of their counterparts? Do they perceive a difference in the status and prestige of each group? How do they see themselves, and how do they think they are perceived by the other group?

Given that too much tension or conflict might be an unproductive force in an organisation (Jehn et al 1997) – particularly among interdependent but occupationally separated staff in schools – this study will examine how IT workers and teaching faculty at an international private school in Singapore perceive their mutual relationships.

1.2 Background: The Rise of Computers in Schools

Placing school technology into historic contexts will help establish the motivation for the study. It will also presage the literature on the occupational culture of IT workers.

Mechanical calculation devices have existed for millennia. Establishing a date for the launch of the *modern* computer depends upon one's specifications. In this study, modern computing begins with the earliest working electronic, digital computer. This distinction eliminates Charles Babbage's Analytic Engine of 1838 (Bromley 1998), as his designs were not built until the late 20th century. Instead, the "first modern computer" was built by Konrad Zuse, whose "Z3" was developed 1939-41 (Zuse 1984).

Documentation regarding the emergence of computers in schools is scarce, though Cuban (1986) covers the early years. Computers made their first large-scale forays into K-12 schools in the 1970s by way of a computer-based learning system called "Programmed Logic for Automated Teaching Operations", or PLATO (Little 2002). This was an expensive system, featuring multi million-dollar mainframes (effectively the "servers" of the time), and €4200 terminals costing further thousands of euros *per month* in communication costs (Little 2002, Dooijes 2008, Allen 2008)

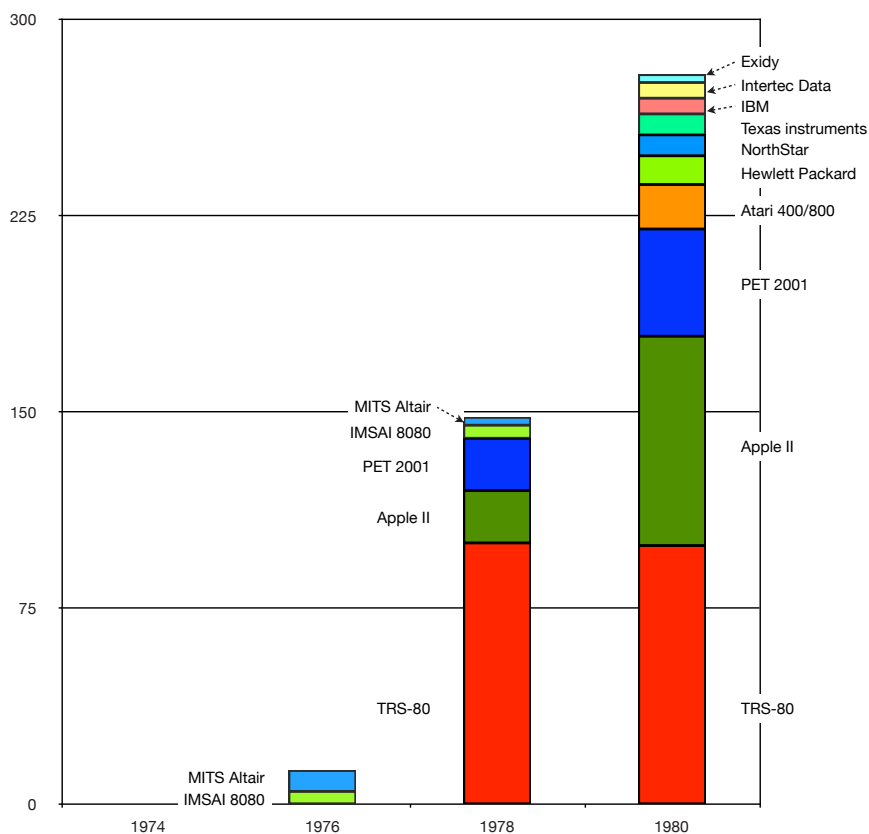
By 1980 there were about 20000 PLATO terminals running in the United States (Goor 1981). The system had been operational for two decades, and it would last another 26 years before the last terminal was retired; active software development last occurred in 1988 (Avner & Avner 1988). Yet in 1980, PLATO had already been eclipsed by a newer technology that was scarcely out of its infancy. Goor's estimate also featured about 30000 microcomputers in US schools. While that pales with current numbers, it is remarkable insofar as the microcomputer – as we know it – was barely three years old.

In 1974, the MITS Altair computer kit was released, reaching an unprecedented level of popularity (Polsson 2010). Smaller competitors promptly released competing kits,

including the IMSAI 8080 kit in 1975 and the Apple I kit in 1976. By the end of 1976, about 32000 microcomputers had been sold in the US, with the MITS Altair and the IMSAI 8080 comprising about 40% of that. However, these were all computers sold in “kit” form: users were required to assemble the components. The Altair kit had 700 parts for the user to assemble – and solder. The *assembly* manual was 103 pages long (Johnson 2008).

It was not until 1977 that the Tandy/Radio Shack TRS-80, the Commodore PET 2001, and the Apple II emerged. Unlike their predecessors, these computers were pre-fabricated machines rather than user-assembled kits. This shift had profound results: at the end of 1978, those three companies – together – had sold 140000 units, compared to the 8000 units sold by MITS and IMSAI. Figure 1.1 shows the magnitude of growth that resulted from the move toward prefabricated microcomputers in the US.

Figure 1.1: Computers sold in the United States per year (thousands)

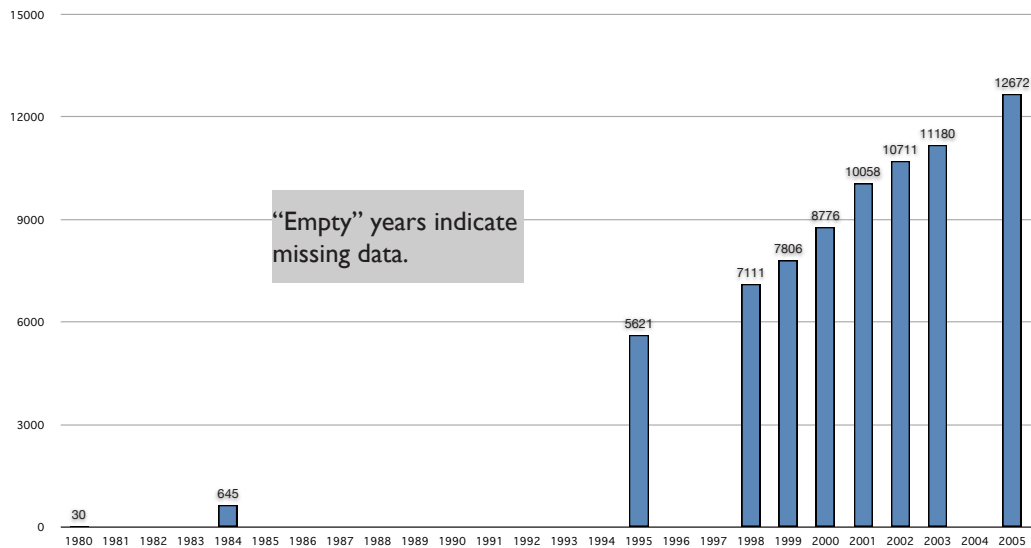


Source: Polsson 2010

Just four years after Goor’s estimate of 30000 microcomputers in US schools, the count stood at around 645000 (InfoPlease 2007; US Census 1985). Fifteen years later the

number of school computers had increased to 10.5 million machines (Allcountries 2006). Accounting for population growth, this amounts to a **per-capita 279-fold** increase. By 2005, that number was 12.6 million (US NCES 2007).

Figure 1.2: Computers in US schools by year (thousands)



Sources: Goor (1981), InfoPlease (2007), Allcountries (2006), US NCES (2007)

Already in 1984, a collation of “Lighthouse” projects in the United States makes note of “...the great technology explosion in education.” (Webb 1984: 9). By the late 1980s, there was evidence of similar interest elsewhere in the world, as noted in Stager’s (1995) description of David Loader’s work at the Methodist Ladies Academy in Melbourne.

By 1992, schools such as Brewster Academy – an independent school in New Hampshire, USA – had moved from simply *having* technology to re-conceiving the school in terms of what could be done with technology (Bain 1996, 2000; Dimmock 2000). Gipson (1998: 1) explains how the “School Design Model” developed and implemented by Alan Bain at Brewster represented a new way of thinking about educational technology:

...the missing link in most educational technology planning decisions lies in an absence of clear definition of what is going to be done with the “goodies and gadgets”... technology often either exists as a tangential activity occurring in discrete computer labs, or as an ancillary activity in some classes.

Elsewhere, the late 1980s saw an interest in the transformative potential of technology even in small, publicly-funded rural schools, such as Keswick Ridge School in eastern Canada, under the leadership of David Nielsen (private correspondence, 2009):

...when I started reading about computers in the late 1970s, I had been teaching for four years and could see the enormous educational possibilities of a “tool” that appeared to be able to do just about anything. My first “educational focus” was of course for myself to learn as much about personal computers as I could.

There is insufficient data to identify a trend, but the pioneers may have been accomplished teachers and administrators – having risen to positions of influence and authority on “conventional” paths – who had a sufficiently deep belief in technology to change the way their schools operated.

As a student in a high school in Canada from 1981 to 1984, I watched this evolution first-hand. With 3000 students in the school, there was one lab in the Business/Trades wing of the school, and one lab in the Mathematics department. This yields a student:computer ratio of about 60:1 – consistent with figures reported by Infoplease (2007) for the 1984 academic year in the United States.

The only other computers in the school were in the main office and in the music department. I became intimately familiar with the music department machines, because the only technician who knew how to fix them worked in an office several kilometres away. As I possessed some familiarity with computers and a willingness to be called out of my other classes, I became the *de facto* technician for those computers.

This leads to the emergence of IT workers.

1.3 IT Workers in Schools

Before they can become useful, computers must be outfitted with operating systems and applications, both of which require patching, protection from malware, protection from users, and sporadic re-installation of everything. Microsoft, for example, automatically releases patches on the second Tuesday of each month. These patches must be reviewed and selectively installed by an organisation’s system administrators. The hardware that hosts the operating system and the applications is also complex, requiring occasional maintenance: from hardware upgrades to faulty drives to the Byzantine intricacies of hardware interrupt settings.

Despite the absence of formal documentation, the emergence of IT workers in schools can be reconstructed in a rudimentary manner by observing that computers in schools will be repaired, and that these repairs may be occurring on school premises. An informal survey of four international private schools in Singapore showed that all four had on-site IT workers. Notwithstanding one outlier³, the typical school had 125 computers for every IT worker. If the worker earns an annual salary of €25000, then each computer can be considered to cost the school €200 each year in maintenance. Over a four year lifespan, that may exceed the capital cost of the computer itself – without including the costs of replacement parts, upgrades, networks, and software.

A further finding of the informal survey technology shows that the four international private schools averaged 2.9 students per computer. This appears to be slightly higher than United States statistics from 2005 showing a national average of about 4 students per computer (InfoPlease 2007). Part of the reason for this difference may lie in the competitive environment in which such schools exist. Cambridge (2001) acknowledges the economics of international private schools: because much of their funding comes from tuition fees, these schools must compete for students. In a modern pedagogic context, this may include ample student access to computers.

This influx of new computers prompted some schools to create in-house technology management and maintenance divisions, staffed with IT workers – and sometimes middle managers. The literature does not reveal when this occurred, but it must have been within that 20-year period of explosive growth, and most of this would be between 1995 and 2005. Writing in the Los Angeles Times, Larry Cuban notes that “Most schools can’t afford on-site technical support.” (Cuban 1999) When there were few computers on campus, it would not have been financially reasonable to have on-site maintenance – a combination of in-house ‘helpers’ combined with outsourced help for major repairs might have been a more typical model.

Although it might not represent larger-scale trends, the researcher’s own experience may confirm Cuban’s (1999) findings. From 1995 to 1999 I worked in a poorly-funded public school in Micronesia. There were over 100 computers on campus, but most serious repairs were effected externally. However, because of the long wait time for such repairs, a few resourceful teachers made many small repairs in-house. The school did, however, recognise the need to begin co-ordinating technology activities across the entire school, and appointed a part-time Media Director in 1998.

3 Three schools showed a consistent computer:tech ratio of 100:1. The outlier was running MacOSX computers in the “Netboot” configuration, with a 400:1 ratio.

From 1999 to 2001 I worked at a prestigious international private school in South-east Asia as a “Technology Coordinator”. There was also an in-house IT maintenance department, initially staffed by a single IT worker, later two. In the years since, the “Technology Coordinator” role has seen an increase in political status and a decrease in classroom teaching hours.

1.4 Why Schools Need – and Teachers Must Work with – IT Workers

In a 1940 short story titled “The Roads Must Roll”, American science fiction author Robert Heinlein presents a society in which transportation is provided by ‘rolling’ roads – large, fast strands of parallel conveyor belts (Heinlein 2005). These “roads” require constant oversight by a group of road engineers, who one day decide to go on strike in protest against their modest socioeconomic status.

The story illustrates one motive for this research: modern organisations rely on the presence of technology systems, yet little is known about how technology clients (in this case, teachers) interact with the individuals who are essential to the continued operation of those mission-critical systems. As the movement of goods is the lifeblood of a city, so does the modern school rely upon the movement of information.

A brief search provides evidence of the damage done by unhappy IT workers:

2008 September 10: “The San Francisco network engineer who is facing four felony charges of computer tampering could end up costing the city \$1 million, according to the city’s Department of Technology.”
(Buchanan 2008)

2009 January 29: “A fired computer engineer for Fannie Mae has been arrested and charged with planting a malicious software script designed to permanently destroy millions of dollars worth of data from all 4,000 servers operated by the mortgage giant.”
(Goodin 2009)

2009 January 7: “An IT expert sacked for lying on his CV hacked into his company’s computer system to spy on his former colleagues – and deleted vital information which led to the loss of jobs. (Croydon Today 2009)

2009 March 17: An IT expert consultant in Australia's Northern Territory "...hacked into the prison, Supreme Court and Parliament House servers... The computer system shut-down cost the NT Government about \$1.25 million in productivity loss, and took about 130 experts in two teams to fix." (Stewart 2009)

It is the complexity of technology systems that differentiates them from other types of infrastructure. While roads, buildings, and electricity are also essential to a school, errors in these systems can be repaired or circumnavigated through relatively simple means. IT workers require a large amount of highly specialised knowledge to operate school information systems⁴.

The loss to teachers from inadequate or malfunctioning school technologies is not reported in the media and is difficult to quantify, but one may expect that the delivery of education is at least moderately reliant upon technology. Cuban (1999) observes that faulty technology often lies at the heart of failed use of computers in the classroom: "... there are still software glitches and servers that crash repeatedly, torpedoing lessons." It may be worthwhile to investigate the relationship between those particular "road engineers" and their most immediate clients.

In the specific context of international private schools, the organisation relies upon the diligence and integrity of IT workers in certain key respects:

- IT workers deal with complicated, expensive equipment that is essential to the operation of the school. A single mistake – for example, the incorrect configuration of a network switch – can leave the school's essential information systems unusable. Administrative operations, therefore, rely upon IT workers.
- IT workers are a key factor in the success of technology-based lessons. As more teachers become more dependent upon technology to deliver content to and collect assessments from their students, so too do those teachers become dependent upon the IT workers. This is clearly laid out in Zhao et al. (2002). Academic achievement of students, to some degree, relies upon IT workers.

⁴ Example: Implementation documentation for the Rediker "Administrator's+" school information management system spans 46 documents and 3880 pages.

- Insofar as senior IT workers may be involved in strategic planning of resources, they may be responsible for a large portion of a school's operational budget. If a school of 2000 students has 500 computers on-site, and if each computer has a capital cost of €600 euro (amortised over 4 years) and occupies 1% of the time of an IT worker costing €25000 per year, then the school will spend €400 per computer, or €200000 per year on technology. IT workers, therefore, operate a nontrivial financial component of the school.
- Perhaps most importantly, IT workers carry the confidences of all users of school technology resources – barring those who encrypt their content. Passwords are no obstacle, nor are proxy servers: all unencrypted files stored on or sent through school systems can be intercepted, read, modified, or deleted – effectively without leaving any trace. Save for the integrity of IT workers, privacy exists only for users who encrypt their files, users whose computers are not connected to any network, and users whose computers are never touched by IT workers.

For school administrators, teachers, students, and parents, there is no danger in *hoping* that IT workers will conduct themselves with perfect integrity, but there are serious implications of *assuming* that they will do so. As Hudson notes:

Systems administrators, high-level IT personnel, and developers have access to privileged passwords – the keys to the IT kingdom, as it were – and thus they possess the power to unleash havoc within a corporation if left unchecked. (Hudson 2007: 2)

Schools are in a position where a specific occupational group – other than teachers – possesses an uncommon and perhaps disproportionate power over regular operations. If that group had evolved over centuries or millennia, then one might expect natural checks and balances imposed to temper their potential to wreak havoc. At the very least, symbols of responsibility might have evolved to inculcate group-sustaining values or acculturate acolytes.

By studying relationships between IT workers and teaching faculty in a small, controlled environment, this research contributes to an understanding of how IT workers and the societies in which they live can most effectively harness the potential of technology with less opportunity for the kind of upheaval foreseen by Heinlein.

1.5 The Research Problem, Aims, and Questions

It has been established that technology is a new phenomenon in schools, existing for just over a quarter century. Personal experience, literature, and observation have also revealed that IT workers have begun to appear in schools to provide operational support for these machines. Finally, it has been suggested that these IT workers could exert significant influence upon school operations. An emerging problem may exist in the relationships between the incumbent professionals and the newer occupational group.

Congruence of values among organisational members can have an impact upon group performance, particularly when there is a lack of congruence in value content and value content intensity (Jehn et al 1997: 10). Wynekoop & Walz (1998: 68) show that IT professionals manifest notably different scores on personality tests when compared with the general population. This may presage inter-occupational conflicts as values amongst the groups lack congruence.

Neither international private school teachers nor IT workers have received extensive attention in academic literature (Hayden & Thompson 2001: xiii; Sylvester 2001) with apparently no work on the intersection of the two groups. Recent searches on ERIC, BERA, Google Scholar, and journal databases returned scant information on specific subtopics. As an example, a search was conducted on the Journal of Research in International Education in late 2008, using the search parameters:

(it OR ict OR technology) AND (worker OR staff)

No references were found.

The absence of literature and theory in this area precludes confirmation, extension, or rebuttal. This prompts a desire to conduct research that may lead to the discovery of new information where none existed before – with methodological implications to be discussed later in this paper.

If existing theory is unavailable, then the research must seek “some level of understanding” (Lincoln & Guba 1985: 37). Therefore, a problem is that nothing is formally known about the relationships between IT workers and teaching faculty, particularly in the context of international private schools.

The aim of this research is to develop a nascent understanding of how IT workers and teaching faculty perceive their relationships, exploring those characteristics reciprocally from both occupational perspectives with the aim of gaining a better understanding of

a key functional relationship in the working of contemporary schools. This aim, if met, would help fill an important gap in the present literature.

As if mapping an unknown terrain, this research will sound the *range* of relationships between IT workers and teaching faculty, as opposed to the quest for a 'typical' case. Therefore, the research must be sensitive to influences that shape the working relationships between these occupational groups.

Based on preliminary reading of related literature and the researcher's prior knowledge, three initial areas of interest have been nominated for further study, each represented by a specific research question. Each of the three questions is considered from both occupational perspectives.

For the sake of clarity, Hoyle's (2001) distinctions between prestige and status will be employed.

1.6 Research Questions

The research problem and research aim set out above lead to a main research question:

How do teaching faculty and IT workers at an international private school in Singapore perceive their relationships?

This main research question can be fractured into three specific research questions:

Specific Research Question 1: From the perspective of participants, how do IT workers and teaching faculty regard their own professional status and that of their counterparts?

This highlights participants' understanding of and claims for professionalism. According to literature, this appellation is loosely worn by teachers (Connelly & Rosenberg 2003; Inlow 1956; Daniel & Okefor 1987), while it is explicitly attributed to IT workers by some of those who study them (Ramachandran & Rao 2006; Guzman et al 2007; Mylott 1986).

IT workers may have post-secondary education and hold multiple technical certifications. Technological change mandates constant study. As a result, school IT workers may have academic qualifications rivalling those of some teaching faculty. The ethical

implications of unfettered and untraceable access to sensitive information mandate a clarification of the professional standing of IT workers.

For their part, teachers have struggled with the acquisition and fitting of the professional mantle as opposed to “teacher qua social engineer” (Hoyle 2001, Johnson 1982, Smolentseva 1993, Goldin 1998).

Doubts of professional status aside, teachers are the dominant occupational culture on the school campus. Incursions by accountants or marketers into the business office or nurses into school medical units might have had less impact, since these incursions did not immediately and regularly impact the work lives of teachers.

IT workers are dissimilar from these other groups in several ways: IT workers may be expected to have a considerable amount of training in the form of post-secondary degrees and constant continuing education; in some cases, the simple absence of IT workers will soon cause disruption to school services as essential machines are left unpatched and un-repaired. And, as mentioned above, all sensitive information held by any member of the school community is accessible by IT workers. Even if IT workers closely resembled another occupational school staff group, their recent emergence into the school would be worthy of study in its own right. The fact that they hold unique characteristics makes the research particularly interesting.

When technology became essential to school operations, then teachers were placed in a position of having to rely upon a new occupational group. Based on the assumptions of symbolic interactionism, where people influence each other's sense of meaning through social interaction, the emerging relationship will be mediated by perceptions of professional status.

Specific Research Question 2: In the views of participants, what is the respective prestige of IT and teacher occupations?

Notwithstanding possible differences in social cultures of IT workers and teaching faculty, there might be differences in perceptions of occupational prestige within a society. Even if both occupational groups share the same understanding of respective status, discontent may arise from those who feel inadequately recognised for their contributions. Unhappiness may also arise from perceptions of socioeconomic status, which has been shown to correlate strongly with perceptions of occupational prestige (Duncan & Reiss 1961). Existing literature suggests that teaching faculty suffer from feelings of insufficient status (Hoyle 2001), while IT workers are beginning to assert their status.

The resulting dynamic remains to be observed, but there is an inherent philosophical conflict between technology and education in that billionaires Steve Jobs and Bill Gates were both college dropouts.

Specific Research Question 3: How do participants from each of the occupations see the relationships between the occupational cultures of IT workers and teaching faculty?

This research interest focuses on the reciprocal perceptions of relationships between the two occupational groups. Working in both teaching and technology, the researcher has observed evidence of conflicting occupational cultures. Although both groups work within the same organisation, the findings of Wynekoop & Walz (1998) imply that their values are not always congruent.

When teachers and IT workers invoke stereotypes about themselves or about each other, the discussion is lifted out of the inter-personal realm and begins to take on general properties. Although generalisation is not a valid goal for this qualitative case study, the researcher will be sensitive to the potential emergence of inter-occupational dynamics, as implied by the literature. An international private school in Singapore has been selected to explore further the reciprocal perceptions of the two occupational groups.

Teachers and IT workers may hold stereotypical views of each other, based on individual-level interactions. The research will reveal whether IT workers and teachers have similar perceptions of their relationships. If discontinuities are found to exist, probes will investigate the nature of the conflict.

1.7 Choice of Research Venue

The research is geographically located in Singapore. In addition to being the researcher's country of residence, Singapore offers three compelling advantages for the conduct of this research.

First, English is widely used, and it is the official language of instruction in local schools. Therefore, the IT workers at international schools, who are typically recruited from the local community, can be expected to speak English.

Second, Singapore is a developed country with excellent technology infrastructure, possibly placing an expectation on international private schools to offer technology resources.

Finally, Singapore is rich in international private schools. Not including “commercial schools” – also known as “study centres” – the Ministry of Education (Ministry of Education 2010) records the existence of 45 “foreign system schools”, roughly synonymous with this study’s appellation of “international private schools”.

Although IT workers tend to be hired locally, there is some level of national and cultural diversity to be found. Singapore itself is a country with four distinct national cultures (Chinese, Malay, Indian, and European). A school’s IT workers may come from any of these cultural groups, leading to one of two possibilities: first, participants may have come from one of several different cultural groups, leading to diversity of views; and second, the multicultural nature of the country itself may have served to ameliorate cultural tensions by rendering them so commonplace as to be irrelevant.

The difficulties of bounding a group of schools as “international” have been documented by Hayden (2001), Cambridge (2001) and Ellwood (2007). However, Cambridge’s characteristics of a ‘typical’ international private school are helpful, as they place the target for the research among the “Foreign System Schools” mentioned above. The research focus is not upon schools that are specific to a certain combination of nationalities of IT workers and teachers. Notwithstanding limitations of the generalisability of qualitative research, it is hoped that the research will have some relevance beyond the boundaries of Singapore. In order to achieve some level of ‘truth’ that transcends the immediate locale, the school to be studied is ‘typical’ in a global sense. These schools are largely free of government restraints, acting – in fiscal and/or pedagogic realms – as unicellular ‘local educational authorities’ or ‘school boards’.

The school featured in this research is recognisably an “international private school” with over 100 teachers, a nonprofit financial orientation, a multinational clientele, and independence from the Singaporean education system. It has operated in Singapore for more than 30 years, and it is well known among expatriates in Singapore.⁵

A more detailed discussion of the choice of school can be found in Chapter 3.

1.8 Significance and Outcomes

Data cited earlier has shown a large increase in school computers between 1980 and 2000, and most of this is limited to the 1990s. Technology clearly has a transformative potential in the school. From e-learning, teaching and learning supported by tech-

⁵ Precise characteristics are not enumerated to cloak the school and participants.

nology, school management and accounting, to customer relationship management and enterprise resource planning, there are few areas of school activity that cannot be augmented through technology. But until those machines – and their physical connections, and the movements of information between them – have reached the simplicity of changing a light bulb, there will be a need for some kind of technical expert to design, implement, and maintain these systems. And in the meantime, it is important for all stakeholders – students, IT workers, and teachers – not just to coexist, but to enhance the capacity to perform at exceptional levels of teaching and learning.

Computer installations in schools are steadily becoming more complex. Individual computers gave way to small networks, to which small servers were connected. Internet connections switched from simple single dialup lines to shared leased lines – which were eventually segregated between sub-networks and assigned individual levels of priority for users, groups, and even individual applications. The internet evolved from an open – if relatively barren – frontier to a ‘tropical forest’ of immense complexity and danger. Firewalls, proxy servers, SMTP, FTP, HTTP, NAS, SATA, tB, HDMI... technicians and users alike are awash in letter combinations that did not exist and could scarcely be imagined just a generation ago.

In the face of this evolution teachers are expected not only to cope with these changes as individuals, but also to re-invent instruction to take advantage of them – a process that Cuban (1999, 2001) has documented as a largely failed effort. Meanwhile, IT workers are – as a largely unconscious process – attempting to forge an identity as purveyors and priests in an emerging technocracy. And while the teacher has traditionally ruled the classroom with few intrusions (Hargreaves 2000, Lortie 2002), this is changing dramatically, as teachers’ work is suddenly influenced, to an unprecedented degree, by an occupational group that might not even qualify as truly “professional”.

This study is the first known attempt to identify the nature of the relationships on the ‘front-lines’ of technology and education: how do IT workers and teachers get along?

By learning about the relationships between IT workers and teaching faculty, members of both groups may gain an understanding of the sources of friction between them. Their frustrations and difficulties will not necessarily be reduced, but at least some level of rational understanding will emerge, allowing members of both occupations to seek effective ways to bridge their differences. Bringing greater clarity to these increasingly important functional relationships might contribute to the greater effectiveness of teaching and learning in school, and ultimately to school effectiveness.

Managers – be they mid-level IT coordinators or more general school administrators – will better understand how the strengths of the relationships can be harnessed toward their school's common goals. In addition, managers may gain insight into the occupational differences between the two groups themselves, perhaps leading to improved hiring and staff retention policies.

On a broader scale, this study will contribute to an understanding of relationships involving two specific occupational groups within an international (multicultural) school setting. Notwithstanding limits upon generalisation, this study may provide part of a foundation for further studies in occupational relationships and international schools. The scarcity of literature that is cited by Collinson at the beginning of this chapter might – by increments such as this – eventually fade into the future.

1.9 Limitations of the Research

Although the researcher has endeavoured to design and conduct this study to high standards of integrity and thoroughness, there are some inescapable weaknesses arising from its exploratory nature.

The limited sample size – prompted by logistical constraints – is too small to permit statistical generalisation even within the context of teaching faculty of either research site. Cohen & Manion impose a minimum of 30 participants (1994: 89-90) per site as a requirement of statistical generalisation. The generalisation potential of the study is further complicated by matters of heterogeneity. International private schools vary widely in the distributions of nationalities of clients and teachers. While some schools are strongly dominated by a single nationality, others – such as the school featured in this study – have less-discernable national characteristics.

Although generalisation is precluded by the numbers of participants and the variety of school contexts, this study aims to contribute to the understanding of relationships between teaching faculty and IT workers at international private schools.

A further limitation was that there was a single interviewer/analyst; interviews were the sole source of data. Therefore, data triangulation, observer triangulation, and methodological triangulation (Robson 2003: 174) are all absent. Although it is tempting to attempt to triangulate views of a relationship by interviewing both participants, viewing a relationship from at least two sides (both participants and, possibly, an external observer) does not carry implications for trustworthiness. Adopting perspectives

of symbolic-interactionism and Goffman's "presentation of self" (1959), this study is epistemologically founded on the premise that relationships are individually experienced by their participants. Therefore, neither divergence nor congruence in the perceptions of relationships necessarily indicates any level of trustworthiness in terms of data, observer, or methodological triangulation.

The gap between national cultures of the researcher and some participants – particularly Singaporean IT workers – may have had an impact on the willingness of participants to speak freely **and** the researcher's ability to interpret communications completely and accurately. This challenge has been noted in the fields of counselling (Sue & Sue 1977) and nursing (Marshall & While 1994).

Even if cultural gaps are not a factor, it must be considered possible that participants do not truthfully report their experiences **or** that their recollections of relevant experiences were not accurate. These are possibilities extending to all studies, whether qualitative or quantitative. However, by presenting a detailed view of a small set of relationships, readers may draw meaningful conclusions about their own situations. The closer the situational distance between the reader's context and those described in the research, the more likely it is that the reader will find useful information in this research.

1.10 Background and Research Positioning

I have been a teacher for 16 years, spending most of this time in international private schools. In addition to teaching, I have also served as a technology coordinator and IT manager in several schools. I have made occasional forays into business, serving as Director of E-Learning and Server Architect for a multinational media company and as a developer on an e-learning platform for mobile phones. I have formal credentials in both occupations, placing myself at the intersection of research, IT workers, and teaching faculty.

Working within a relatively small field, it is inevitable that I should have some connections to the research venue and some participants. The implications of this are thoroughly discussed in Chapter 3. I may thus hold certain predispositions and biases towards the subject matter, but I am aware of the need to minimise such personal views wherever possible, while realising the obligation of the researcher to offer explanatory interpretations of participants' accounts – the *etic* and *emic* perspectives. It will be clear which of these is being presented at any time.

1.11 Outline of Thesis

This thesis consists of seven chapters. The background of the research has been explained in this chapter, including a statement of the problem, the background, aims, and significance of the study. The main research question and several specific research questions have been articulated. The existing knowledge of the field is discussed in Chapter 2, the literature review. The literature is broadly based but sparse, leading to a broad review of disparate strands. The research design is presented in Chapter 3 - the methodology chapter – matching “best-fit” methods of data collection and analysis to the ontological and epistemological underpinnings of the study.

Chapters 4 and 5 provide an overview of the key discoveries, with specific reference to the research questions. In Chapter 6, the findings are discussed in light of the literature. Finally, Chapter 7 offers some implications and recommendations arising from the research.

“Conflict is created in part because the ISE subculture has different norms, language, and practices from other groups in the organization.”

Guzman et al (2004)

Chapter 2. Review of Related Literature

Table 2.1: Abbreviations

| Abbr. | Plural | Meaning |
|--------------|---------------|---|
| CIS | | Council of International Schools |
| IB | | International Baccalaureate |
| IBO | | International Baccalaureate Organization |
| IGCSE | | International General Certificate of Secondary Education |
| IPS | IPSeS | International Private School(s) |
| IS | | Information Systems |
| ISE | ISEs | Information Systems Employees |
| IT | | Information Technology |
| ITW | ITWs | Information Technology Workers |
| TFac | | Teaching Faculty |
| TMRC | | Tech Model Railroad Club (at the Massachusetts Institute of Technology) |

Chapter 2 Contents

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2.1 Introduction and Purpose

Chapter 1 established that the purpose of this study is to gain an understanding of how teaching faculty and IT workers at an international private schools in Singapore perceive their reciprocal relationships. The rise of computers in schools has been documented, and with it the emergence of IT workers. The motivation for the study – a desire to begin to understand the relationships between teaching faculty and IT workers – has been introduced, and the research question has been presented.

This research will study the relationships between IT workers and teaching faculty at an international private school in Singapore, based on the *perceptions* of those relationships by the respective participants. The main research question is

How do teaching faculty and IT workers at an international private school in Singapore perceive their relationships?

The specific research questions are:

1. From the perspective of participants, how do IT workers and teaching faculty regard their own professional status and that of their counterparts?
2. In the views of participants, what is the respective prestige of IT and teacher occupations?
3. How do participants from each of the occupations see the relationships between the occupational cultures of IT workers and teaching faculty?

Each specific research question applies to both occupational groups, effectively yielding six specific research questions. However, it will be demonstrated that relationships – and an ability to perceive them – are not necessarily symmetrically distributed across both occupations.

This literature review will begin with a discussion of the general state of literature in the fields being studied. A theoretical foundation will be established on the basis of canonical work in relationships, using symbolic interactionism as an initial conceptual framework. That conceptual framework will then be modified with respect to the specific occupations under consideration. International private schools will be discussed insofar as the schools and their employees may represent a deviation from the norms predicted by the literature. Three major themes will be examined, each with respect to both teaching faculty and IT workers: professional status, occupational prestige, and

occupational culture. Finally, gender will be examined as a possible mediating factor in the relationships between IT workers and teaching faculty.

Gall, Borg, & Gall (2003: 91-92) identify six purposes of a literature review, the last being “seeking support for grounded theory”. Such is the purpose of this literature review – with two caveats. First, although grounded theory methods were used in this research, no grounded theory was developed. And second, much of the literature was reviewed prior to the onset of data collection (not after, as Glaser might recommend (Glaser 1978; in Gall, Borg, & Gall 2003: p 91)) in order to establish theoretical sensitivity prior to entering the field. This “sensitising” is consistent with the approach used by Freeman (2000: 298):

It was difficult to launch into the field of inquiry... without some notion of what one was examining. ... In other words, it seemed reasonable as a starting point to point out what one was looking at, while leaving open what one was looking for, to suggest the form without defining its content. What was needed was an a priori conceptual framework that was essentially content-free.

Following fieldwork, the researcher acknowledges the value of Glaser’s stricter approach. Although sensitising is valuable, there is a risk that the existing literature may cause the researcher to look for phenomena that do not exist or are muted in the field.

The literature presented in this chapter led to the development of a preliminary construct for the understanding and analysis of interactions between teachers and IT workers. By way of revision throughout the research process, it formed the foundation of the interview schedules and the subsequent analyses of interviews.

2.2 The Relevance of Scarce Literature

If a research subject has not specifically been studied, then the literature review must draw upon related resources as a foundation for the new findings. As Flick (1998: 44) notes, “the research process, too, does not start as a *tabula rasa*. The starting point (for grounded theory) is rather a pre-understanding of the subject or field under study.”

Although the sociology of schools and teachers have received some attention, there is a dearth of research into relationships between IT workers and teaching faculty.

As recently as 2006, Collinson observed that research on occupational groups within academia was been scant, and focused “almost exclusively” (2006: 267) on teaching staff rather than those occupying support positions. As a result, the search for literature has been broadened to include relevant learning from fields not directly related to the study.

However, gaps remain. The literature on teaching in international private schools is still scarce. Only three English-language journals cover the field of international education: the Journal of Research in International Education, International Schools Journal, and the Journal of Studies in International Education. And while a small amount of research has been done on IT workers as an occupational group, the interactions between those workers and teachers is missing in the literature.

2.3 Theoretical Foundation: Symbolic Interactionism and Goffman’s “Presentation of Self”

This study seeks to gain a level of understanding of how both participants in a professional dyad perceive that relationship. Although Blumer’s (1956) symbolic interactionism has methodological implications, it is also pivotal in the construction of an *a priori* analytic framework.

Hofstede (1980: 14) asserts that an individual’s inner reality (or realities) cannot be directly observed: “What we can observe is only behavior, words, or deeds. When we observe behavior, we infer from it the presence of stable mental programs.” In this study, which seeks to understand participants’ perceptions of their reciprocal relationships, the role of fieldwork is to provide evidence that illuminates the nature of certain mental programs.

Blumer (1969: 1) describes symbolic interactionism as “a label for a relatively distinctive approach to the study of human group life and human conduct.” Gall, Borg, and Gall (2003: 638) define it as “the study of how individuals engage in social transactions and how these transactions create and maintain social structures and individual self-identity.” This latter definition specifically includes the social and the individual strata.

Four types of self-and-social phenomena will be considered in this section. The first phenomenon is that of self-awareness.

The model of interactions used in this study begins with George Mead's "Genesis of Self and Social Control". Mead's central contention is that "selves exist only in relation to other selves" (1925: 262). Blumer (1966: 536) later amplified this, adding that self-recognition is a process that occurs within a social context:

...the process of self-interaction puts the human being over against his world instead of merely in it, requires him to meet and handle his world through a defining process instead of merely responding to it, and forces him to construct his action instead of merely releasing it.

The requirement upon the individual to shape a 'self' within perceptions of social reality constitutes a kind of constantly re-defined self awareness within a social context. It will shortly be demonstrated that this self-awareness cannot safely be assumed equally for all participants.

A second type of interaction is the interpretation of incoming gestures or actions and the calculated response to those events. Blumer (1966) argues that people do not respond directly to the gestures and actions of others, but rather according to the symbolic interpretation ascribed to those stimuli by their recipients.

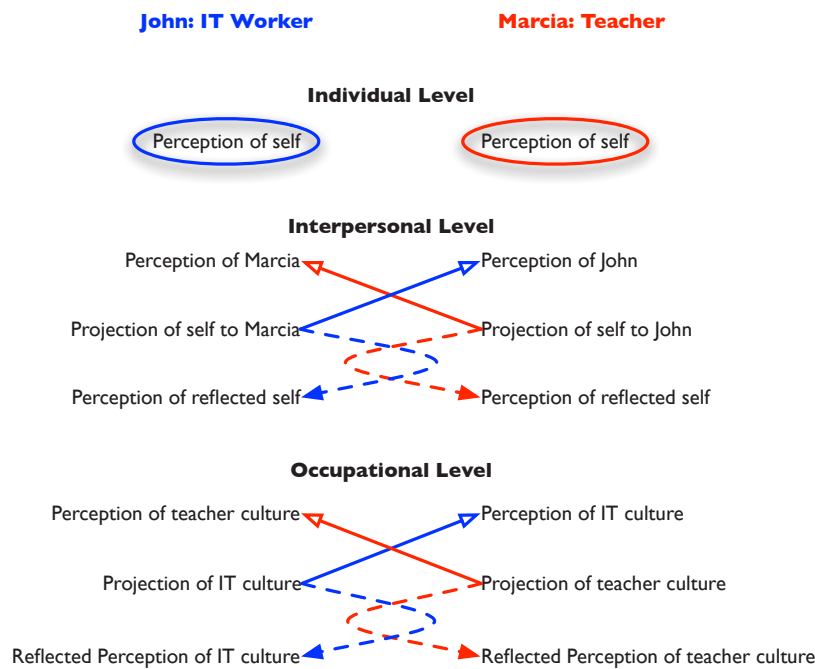
The third perspective is Cooley's (1922) and involves extending the typology of social interactions to a reflective realm. His argument is that identity is constructed not only in how people see themselves and others, but also in how they believe that others perceive them. This was labelled by Cooley as the "looking-glass self" (1922: 184): "...in imagination we perceive in another's mind some thought of our appearance, manners, aims, deeds, character, friends, and so on, and are variously affected by it." A century later, Kennett (2002: 343) reiterates this notion, citing research in early childhood development showing that "one learns about and develops one's own mental states in concert with others."

Goffman's "presentation of self" (1959: 198) extends Cooley's argument to include specific role dynamics, observing a specific situation relevant to this study:

Often, when two teams enter social interaction, we can identify one as having the lower general prestige and the other team the higher. Ordinarily, when we think of re-aligning actions in such cases, we think of efforts on the part of the lower team to alter the basis of interaction in a direction more favorable to them or to decrease the social distance and formality between themselves and the higher team.

Taken as a quartet, Mead, Blumer, Cooley, and Goffman lead to the following diagram:

Figure 2.1: Initial framework of relationships (symmetry assumed)



Each participant has a sense of self, a sense of the self being projected to the other participants, and a sense of the projected self as seen by the other. It is expected that most participants will engage in these multivariate perceptions on interpersonal and occupational levels. However, the *degree* of this perception must be called into question, both *prima facie* and also with specific reference to the IT worker occupation.

A Complication: The symmetry in Figure 2.1 depends upon all parties being approximately equal as social beings. However, Goffman's observation regarding teams of different prestige levels illustrates the expectation that different individuals and groups will approach social interaction from different perspectives.

The discontinuity may be even more pronounced than one of mismatched social strata. Beyond anecdotal evidence and widely-held stereotypes that IT workers are socially different lie the findings of Myers (1991) and Wynekoop & Walz (1998). Myers' review of the literature makes the useful distinction between different types of IT workers, observing that social-interaction requirements vary according to type of technology worker (user-support vs. programming).

Wynekoop & Walz (1998) show that IT workers have personality index scores that are significantly different from those of the general populace, dividing their respond-

ents into technical subgroups. However, while Myers uses programming languages as a differentiator, Wynekoop & Walz use occupational hierarchy, from programmer to analyst to manager.

The levels of deviations from the norm reported by both Myers and Wynekoop & Walz are logical: programmers can work in relative isolation; analysts must meet with clients as well as programmers; and technology managers must organise the efforts of groups of people. While this appears to imply that career advancement is directly related to social skill, it also reflects a spectrum of social skills.

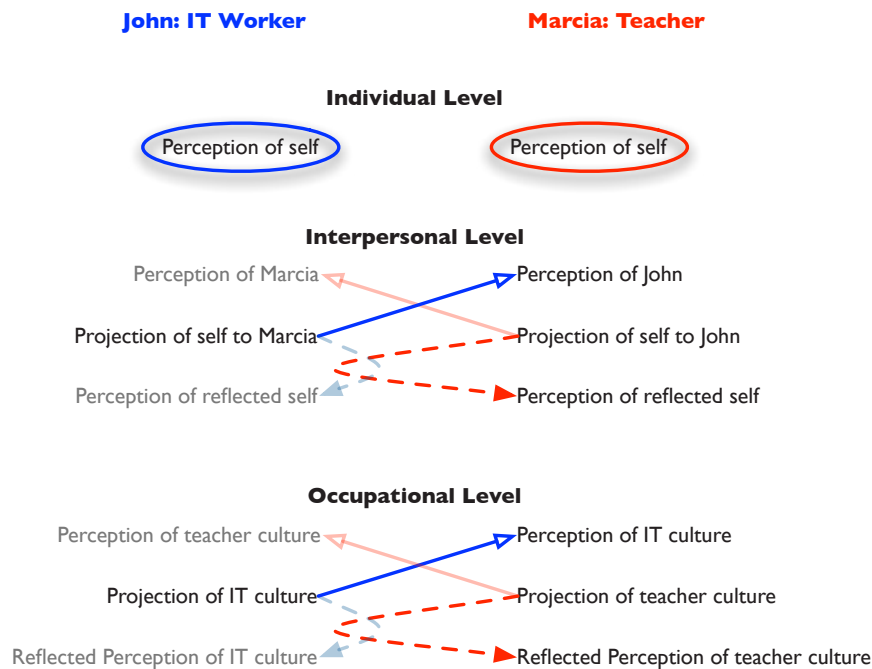
Although a discussion of pervasive developmental disorders is beyond the scope of this thesis, there are hints in the literature (Mayor 2008, Silberman 2001, DeLong & Dwyer 1988, Baron-Cohen et al 1997) that IT workers may manifest a constrained level of social sensitivity.

Looking at both occupations within the study, IT workers and teachers may occupy opposite ends of a “pastoral” spectrum. Lortie (2002: 106) notes that for his research participants “Other sources of satisfaction pale in comparison with teachers’ exchanges with students and the feeling that students have learned.” If a perceived effect upon others is a compelling motivator for teachers, then they may possess an *expanded* sense of reflected self.

In a 2005 interview, Aspergian, Nobel Laureate, and Professor of Economics Vernon Smith notes that, while teaching is a highly social activity, he takes comfort in relating to students on a professional dimension within the confines of his field of expertise (Herera 2005). The professional role, then, acts as a reassuring ‘stage’ that constrains interactions to a limited and learnable set of tightly-followed scripts. The implications for this research are that participants in either profession may be able to maintain perfectly acceptable professional relationships within a narrow, well-defined context. So while research implies the possibility of anomie, it may be present in both occupations – yet masked by an ability to deliver an expected professional performance.

In light of this complication, the model of interactions initially presented in Figure 2.1 may require modification.

Figure 2.2: Adapted model of relationships (asymmetrical)



As shown in Figure 2.2, some participants may manifest limited interpersonal interactions with their colleagues. Sacks (1995) describes the efforts of one of his research participants to predict such interactions as a strictly logical process – something to be *solved* rather than *understood*. This “mindblindness” (Baron-Cohen 2002) – that is, a reduced ability in “making sense of and predicting another’s feelings, thoughts and behaviour” – suggests that the ability to be conscious about “projection of self” and to read the “reflected self” may vary among research participants.

This possibility gains further evidence in Vernon Smith’s comments regarding creativity (Herera 2005). Even more important than an ability to “switch out and go into a concentrated mode”, Smith identifies his creativity: “I don’t have any trouble thinking outside the box... I don’t feel any social pressure to do things the way other people are doing them, professionally.” This creativity may underlie findings by Wynekoop & Walz that “individuals preparing for careers in information systems... are more creative, on average, than the general population.” (1998: 64)

This area of the literature sensitised the researcher to the possible existence of asymmetrical symbolic interactionism as well as individual coping strategies.

2.4 International Private Schools as Unique Organisations

The characteristics of international private schools reduce the applicability of tangential literature to the specific research at hand. As observed by Hayden (2001), research in international education is constantly evolving, making it difficult to highlight specific trends. Statistical figures are outdated by the time they are published. At the same time, evolving patterns of globalisation lead to rapidly changing social and business environments in which international private schools operate. Garton (2000: 85) notes factors such as “economic and political crises, as well as natural disasters... geographic range” affecting the operational context of these organisation.

Even the defining characteristics of international private schools are difficult to establish with any degree of rigour: Hayden & Thompson (1995: 332), in the Oxford Review of Education, offer the following definition: “...a conglomeration of individual institutions which may or may not share an underlying educational philosophy.”

Rather than attempt to define the concept of “international private schools” by imposing parametric boundaries, Cambridge (2001) creates an amalgam of characteristics as a ‘representative’ picture of international private schools, refining and extending those characteristics in a later paper (2002). Thompson (2001) focuses not upon the schools themselves but rather upon the curriculum they teach, sidestepping the matter of defining the institutions themselves and discussing “international education” instead. Hayden (2001) also discusses the curriculum, also avoids an attempt to define international schools, but shifts the ground to a more workable point: she identifies schools by their voluntary associations with each other under organisations that promote certain values. Bunnell (2006) argues that the ad-hoc nature of such associations should give way to formal arrangements – effectively for purposes of quality control.

Certain specific characteristics of international private schools must be highlighted in order to place the literature into an appropriate perspective.

Size: International private schools are usually relatively small, often comprising individual institutions. Some are part of a group of related schools, run either by non-profit organisations or for-profit concerns. Among the largest are presented in Table 2.2.

Table 2.2: Demographic data for large chains of international private schools

| Name | Countries | Schools | Students |
|-----------------------|-----------|---------|----------|
| GEMS Education | 8 | 70+ | 100000 |
| Sabis/Choueifat | 15 | 60+ | 45000 |
| Global Indian | 7 | 19 | 17000 |
| Cognita ¹ | 4 | 9 | 15000 |
| United World Colleges | 12 | 12 | 6065 |
| Nord Anglia | 7 | 9 | 6000 |

Sources: *www.gemseducation.com* ; *www.sabis.net* ; *www.globalindian.org.sg* ; *www.cognitaschools.co.uk* ; *www.uwc.org*; *www.nordanglia.com*

Single-school entities vary from a few dozen students to thousands (Stinson 2008).

Funding: Notwithstanding cases where a school might receive funding from a ‘home government’, international private schools (IPSeS) are typically self-funded on a school-by-school basis (Hayden 2006). Particularly in cases where multiple IPSeS operate in the same city, this leads to a competitive market where schools will vie for students, carving out niches based on market factors such as location, fees, facilities, and faculty. Garton (2000: 86) quotes a private communication with Forrest Broman: “The international school Head’s best possibility to influence learning is through the teacher he/she hires. Thus no stone should be left unturned in the search for the best possible candidates.”

Teaching Faculty: Teachers at IPSeS fall into three broad categories: career international teachers, who periodically migrate to new positions; local expatriate teachers, who are typically the spouses and parents of school clients; and local/native hires who might otherwise work in local schools (Garton 2000). The first two of those categories command salaries and/or benefits that are greater than their local/native colleagues. Just as schools pursue clients, they may also be in a position to pursue faculty – who then attract students. The financial package is the chief recruiting tool, with variations contingent upon school prestige, location, and working conditions.

¹ Cognita’s demographic statistics are complicated by the existence of two divisions: although numbers are cumulative, its UK-based schools are better regarded as “independent” rather than “international”.

Transience among expatriate teachers is important in that it differs from models of domestic teachers such as those assumed in Lortie's work (2002). When the labour force is highly mobile – typically committed to two-year contracts – it becomes easier for teachers to move from one school to another. In contrast with domestic teachers, who may find themselves buying houses and setting down roots in a community, expatriate teachers may be more likely to move to a more attractive school when such opportunity arises. Schools that offer freight allowances as well as 'moving-in' subsidies reduce transition costs to negligible levels. Assuming a stable market, one may expect the rapid convergence of the most desirable talent in the most desirable schools.

Hayden (2006: 11) notes the tension inherent in creating an "optimal balance" between expatriate and local teachers. Canterford (2003) distinguishes non-profit and for-profit schools in this regard, insofar as the latter are more likely to hire less-expensive teachers to the limit of acceptability by parents.²

Clientele – Finances: Among six Singaporean IPSes listed in the International Schools Services Directory of International Schools (Stinson et al 2008), the average cost of tuition for senior students is €8500 per year. As a direct result, the clientele for IPSes will be those individuals who can either afford the tuition fees themselves **or** persuade their employers to underwrite those costs.

Clientele – Cultures: Because IPSes garner their clientele from among the ranks of upper-level business managers and the diplomatic corps, students may hail from a broad range of countries – often using English as a common language. Owing to government regulations, there are very few local students in Singaporean IPSes.

Curriculum: Curricula at IPSes vary from purely local creations to those that are fully dictated by external organisations – including corporate systems (as in Sabis/Choueifat), regional/national systems, and the IGCSE (International General Certificate of Secondary Education).

The presence of an external curriculum implies some levels of quality controls, ranging from site inspections and accreditation to external moderation of grading standards. IBO and CIS accreditations, for example, are serious undertakings which demand large investments of time and money on the part of schools and teachers. The existence of complex, externally-controlled curricula carries implications for teacher professional-ism which will be discussed shortly.

2 This should not be taken as an implication that local hires are less good as educators; merely that there is a tendency among parents to prefer western-trained teachers (Canterford 2003)

Teacher Salaries: Because of the range of IPS situations, it is difficult to make sweeping statements about working conditions. In the case of expatriate teachers, international private schools must offer inducements to those teachers to leave their home countries, whether in salary, benefits, quality of work, and quality of life. These benefits will typically be inversely proportional with the desirability of the location itself: a school in a ‘hardship post’ can be expected to provide greater salary and benefits than a school in a temperate, fully-developed country – notwithstanding the indexing effect of cost-of-living allowances. For locally-hired expatriates and local hires, the situation is more complicated: prevailing economic conditions may create either a buyer’s or seller’s market – driving salaries and benefits in opposite directions. Canterford (2003: 61) describes a situation in which a locally hired head of department was receiving only half the salary of one of the expatriate teachers in the same department.

Teacher Cultures: According to the Directory of International Schools (Stinson 2008), there were 34,233 teachers working at the international schools reporting to the Directory. Four IPSes in Singapore provided demographic data, covering 1045 teachers. Singapore schools can be compared with IPSes globally (see Table 2.3).

Table 2.3: Countries of origin of IPS teachers

| Country | Teachers | %Globally | %Singapore |
|---------------------|-----------------|------------------|-------------------|
| United States | 11399 | 33% | 25% |
| United Kingdom | 4657 | 14% | 27% |
| Host Country | 10203 | 30% | 5% |
| Other Nationalities | 8217 | 24% | 43% |

Source: Stinson 2008

The numbers are not surprising, but they underscore a key point: although they are located in a Singaporean national context, these organisations may be expected to manifest *some* national cultures that are similar to those described in the research.

2.5 Implications of IPS Conditions for the Literature

The professional, financial, and cultural dynamics of international private schools may be notably different from those of their domestic counterparts – patriate or local. The literature under review is primarily helpful in establishing an initial understanding of

the field of research, with the proviso that it may offer limited applicability to the specific context of the study.

The existence of complex, externally-mandated controls over teaching content and methodology may strengthen the case for teacher professional status. By having global, objective standards for instruction and assessment, teachers can claim conformity with canonical practice in a manner similar to other professions.

The financial position of the typical international private school – relying on high tuition fees – and the target market of expatriate employees at upper economic strata both affect the school technology climate. Client families may be expected to have computers in the house, and likely use them at their own workplaces. School fees may create an expectation of nominal levels of technology support. Statistics from Infoplease (2007) and an ad-hoc survey of four international private schools in Singapore suggest that the IPSes have more computers per student (1 computer per 2.9 students) than their US counterparts (1 computer per 4 students). One research participant reported “insider information” that a student laptop programme had been established at a Singapore IPS **not** for pedagogical reasons, but rather for marketing reasons.

Non-local teachers predominate in international private schools. Only 5% of the IPS teachers in Singapore were from Singapore, according to data from ISS (Stinson et al 2008). If hiring teachers from overseas is expensive, schools are likely to favour those teachers who promise to demonstrate a high degree of cultural adaptability and resilience. As a cosmopolitan, developed country, Singapore is an attractive destination for many teachers, so recruiters may be able to exercise greater choice over candidates; coupled with the imperative that a teacher must be willing to live overseas for an extended period, it may be that the teachers at international private schools in Singapore may be notably different from those in ‘domestic’ sociological studies.

According to statistics from the United States General Accounting Office, only 28% of American citizens held passports (US GAO 2008: 11); in Canada, the number was 52% (Canada OAG 2009: 7); in the UK, at least 72% of the adult population held a passport (UK Hansard 2004).

In the UK and in Canada, a teacher with a passport cannot be considered unusual. However, expatriate teachers from the United States are quantitatively exceptional insofar as they have demonstrated a willingness to travel beyond their national boundaries. Across all nationalities, a willingness to work outside of the known comforts of

home separates expatriate teachers from their domestic counterparts. There is reason to suspect, therefore, that sociological treatments of domestic populations may not apply perfectly to expatriate teachers.

This problem of transferability of educational management principles across cultures is dealt with at length in Dimmock & Walker (1998, 2002), Hallinger & Leithwood (1996), and Dimmock (2000). Noting the difference between ‘culture as characteristic’ and ‘culture as constructed artifact’, Dimmock and Walker (1998: 563) argue that neither interpretation “considers the relationship between the organization and its broader social environment.”

Indeed, it is not clear precisely *what* the ‘social environment’ of an IPS is. It is not necessarily the ‘home’ culture, since many IPSes exist within a cultural context foreign to that of the clients, and the teachers who work there demonstrate an international curiosity that is sometimes markedly at odds with some of their domestic peers. The national culture of the school also cannot be that of the host country, because an IPS by dint of its “international” and “private” identifiers sets itself apart from the policies and standards of public schools in the host nation.

Depending on staffing and student intake policies, IPSes may even lack any kind of distinct national culture. Although some schools in Singapore have strongly dominant staff nationalities, the average dominant nationality across seven IPSes in Singapore was only 68%; about 1/3 of teachers, on average, came from a country *other than* the dominant nation (Stinson 2008).

Having established a conceptual framework and identified the mediating factor of the international private school context, the literature on each of the occupational groups will be examined in terms of professional status, occupational prestige, and occupational culture.

2.6 Professional Status and Occupational Prestige

Professional status is a foundation of this study: if members of either group harbour doubts about their professional standing, then they may have difficulty adjusting to the presence of a second occupational group with an equal claim to professional status.

Professional status and occupational prestige are subtly different concepts. Hoyle (2001: 139) notes political concerns regarding teaching with the observation that the generic term of ‘status’ “...embraces three relatively independent phenomena, here la-

belled *prestige*, *status* – given here a more specific connotation than the generic term – and *esteem*.” With the caveat that the labels are less important than the differences between them, Hoyle argues that *prestige* is a continuum – a matter of comparative ranking in public perception, whilst *status* is a quantum – more a matter of categorisation. *Esteem* is the regard accorded to the occupation owing to the public’s perception of individual practitioners.

This atomic separation of the “status” concept into components is at odds with other researchers who conflate these different qualities. Abbott (1983: 820) argues that “Status systems are generated by bases or dimensions of honor – power, wealth, knowledge.” In so doing, Abbott includes the notion of public perceptions of practitioners with the continuum of comparative power and wealth, while the concept of “knowledge” lends itself to a stratification that Hoyle might equate with his strict notion of “occupational status”.

For the purposes of this study, professional status and occupational prestige are regarded as two different qualities. By Hoyle’s own admission, “esteem” is “the most diffuse of the three basic concepts...”, holding that it is “the regard in which an occupation is held by the general public by virtual of the personal qualities which members are perceived as bringing to their core task.” (2001: 147). It is accorded less attention in journals than the other two. For this reason, Hoyle’s thoughts on esteem will inform an analysis of incoming information, but will not be further explored in the literature.

2.6.1 Professional Status of Teachers

Teachers are globally and historically regarded as members of a low ranked or marginal profession. Inlow (1956: 257) observes their “...almost pathetic desire for society to recognize them as members of a profession.” This is historically based: teachers have traditionally served a master other than those whom they operate upon, and they have typically had marginal control over their products, methods, and membership.

Hoyle (2001: 144) asserts that teaching is *formally* regarded as a profession, while a *semantic* understanding of the term is ambiguously used “as a carrot or as a stick” to compel certain behaviours on the part of teachers by managers, political figures, and the public.

The ambiguity over teachers’ professional identity transcends historical and national boundaries. Writing in 1903, Moore (1903: 355) sadly observes, “The teacher is held

in little esteem; he holds himself in little esteem.” Moore argues that it was the education system of ancient Greece that led to the cultural subjugation of Rome. There is global evidence that educators have been the collective handmaids of political will.

In the Muslim world, Berkey notes:

“Both Muslim reformers and the contemporary historians, anthropologists, and others who have studied their efforts... have shared the conviction that education can be a critical force for change.” (Berkey 2007: 41)

Nasaw (1975) argues that educators in the United States have historically served the objectives of a state that desires a certain type of citizenry. The servitude of teachers in carrying out that mission has been a detriment to their professional status. Herbst (1989) supports that view, going back to the early 19th century United States, where public education was a vehicle for political parties to consolidate their power. Furthermore, in both the United States and in Prussia, Herbst notes that early-19th century activities saw a movement of influence over education:

“...the pressure to consider a more active role for the state in education came not from teachers, parents, or local taxpayers, but as with Jefferson and Humboldt, from philosophers, statesmen, authors, and politicians.”
(Herbst 2002: 321)

It may be argued that, by placing itself ahead of any parties actually involved in the daily educational process, the state asserted its status as prime stakeholder, prime beneficiary, and accordingly asserted its interests ahead of all others.

Smolentseva, describing challenges facing Russian academics, observes that the first Russian university (founded in 1755) “...was from the very beginning oriented toward the state and its needs.” (2003: 392) During the Soviet period, state control over education was extensive, leading to the “politicization and ideologization of the entire educational process.” (2003: 396)

Johnson describes the use of four different systems of education in South Africa to maintain that country’s system of apartheid, focusing on “...the role of education in transmitting the values, norms, myths, and ideology that support established patterns of social differentiation.” (1982: 215) However, rather than abandoning the concept

of education as a tool for social control, he favours a reversal: “Radically altering the structure and content of existing education is a sine qua non for the creation of an egalitarian nonracial, democratic society.” (Johnson 1982: 215)

This interposing of states into the teacher-student process contributes to Hoyle’s assertion that the teaching occupation suffers from “ambiguity” (2001: 141) A further issue pertaining to teacher occupational status is the question of whether teaching even qualifies as a profession.

Initially stating that popular opinion is not sufficient to confer the professional mantle upon an occupation, Inlow (1956) immediately goes on to argue that medicine, theology, and law are professions because “they have the approval of tradition”. He further classifies professions as distinct from other occupations insofar as they are “dedicated to the function of service” (1956: 256) and maintain membership controls while performing some level of self-policing to maintain standards. For both of the two occupations involved in this research, the first of those conditions is satisfied, the second is evolving, and the third is largely absent.

Inlow’s second condition – that of membership controls – appears to have been satisfied sometime between 1956 and the present. Teaching is no longer dominated by “poorly educated individuals, with a year or two of technical training but little or no general education” (1956: 258).

Inlow offers a functional test for the third condition:

Teachers (should) establish, and bring into operation, reasonable controls over themselves and resist improper pressures even from a local board of education. If they succeed, they are professionals. If they fail, they must face the fact that they have not yet “arrived”. (Inlow 1956: 258)

Daniel & Okeafor (1987) discuss the “myth of professionalism”, arguing that teachers’ assertions of professional status are a means to avoid close administrative supervision and overlook the mistakes of their colleagues. Isolation in the classroom, they say, serves to mask an inadequacy that only begins to abate with experience. This implies the absence of a useful canon upon which a neophyte teacher may draw a sense of professional competence. However, international private schools’ adoption of external curricula and assessment criteria counters this argument.

Approaching the question of professional status from a different angle, Ingersoll & Alsalam identify characteristics of professions (1997). Connelly & Rosenberg (2003) base their work on those characteristics, comparing both general education and special education with four occupations commonly regarded as “professions”: medicine, law, engineering, and social work:

| Characteristic | Present in Teaching |
|-----------------------------|----------------------------|
| Complexity of work: | no |
| Lengthy induction period: | no |
| Ongoing growth: | yes |
| Specialisation & expertise: | no |
| Authority over own actions: | no |
| Relatively high salaries: | no |

Like Inlow (1956), Connelly & Rosenberg (2003) conclude that general education does not yet constitute a profession, though it has the potential to become one.

Rowan (1994), in a discussion of teachers’ professional status, emphasises the complexity of *knowledge* as a component of professional status. This raises a key problem in perceptions of teachers’ work, as highlighted by Hoyle (2001): the public might not distinguish a simple *product* (the content of a primary education) from the *process* of instruction. Because nearly all adults have a first-hand knowledge of a pre-tertiary education, the absence of a technical vocabulary (Hargreaves 1980) leads to a ‘demystification’ of teacher activities.

International private schools that subscribe to either IGCSE or IBO moderation are less isolated than Daniel & Okeafor imply. These schools are required to submit graded samples of assessed student work for external moderation – not for student assessment, but rather to verify that teachers are grading student work appropriately. IBO programmes are monitored by exhaustive self-reporting and periodic site visits. The jargon of assessment – particularly with respect to the IBO – is becoming increasingly complex and jargon-laden, countering Hargreaves’ charge of ‘demystification’.

Regarding Inlow’s third condition, IPS teachers experience benefits and drawbacks from the absence of trade unions. In the case of small, independent schools, conflict between school boards and teachers are resolved without recourse to lengthy bureaucratic procedures. A more important difference is the mobility of career international teachers. Accustomed to frequent changes of location, these teachers are likely to trans-

fer to new schools in order to escape unfavourable situations. Given the costs of hiring new teachers from overseas, schools may place a premium on positive relations with teachers in order to avoid those costs.

Furthermore, the social networks established by these teachers suggest that schools and school leaders will quickly earn reputations. Because of the relative numbers involved, individual teachers may also develop broadly-known reputations. While most IPSes have an inherent level of 'exclusivity' insofar as they are both "international" and "private", the most prestigious of these may demonstrate a trend similar to that described by Evans (2002) in her work on "magnet schools" in the United States, where the professional status of teachers was seen to have been increased among teachers working environments that were "less bureaucratic... free to innovate and respond to the needs of the community and students".

IPS teachers, therefore, experience reduced switching costs and increased access to information, suggesting that the job market for international private schools may be 'efficient' (US CFTC 2010)

2.6.2 Professional Status of IT Workers

While accounts of teaching extend millennia into the past, the occupation of the IT worker has had less time to evolve. Mechanical devices to assist with mathematical tasks have existed for millennia (Price 1984) but early machines were not "computers": they were calculators whose inputs and operands were set by hand for each equation. A machine which allowed complex equations with stored values and operands was not conceived until Babbage developed the plans for his Analytical Engine in 1837 (Bromley 1998). However, it was a mechanical device; programmable digital electronic computers did not arrive until Konrad Zuse developed his "Z3" computer between 1939 and 1941 (Zuse 1984). IT as an endeavour has had only 70 years to develop, with occupational progenitors migrating from mathematics and engineering.

The United States General Social Survey of 1947 (Duncan & Reiss 1961) included neither "technology" nor "computer" in its list of occupations. As computers were developed in and purchased by universities in the 1950s and 1960s, an occupational culture began to emerge. However, the numbers of machines still would have been relatively small. The general case of a school-based IT worker likely emerged sometime during the phenomenal 20-year period of explosive growth from 1978 to 1998 (Pols-son 2010, US NCES 2007).

With less than 70 years to establish an occupational status, two options emerge to determine whether the literature calls for the professional mantle to be accorded to IT workers. First, lists of occupational characteristics may be studied to determine whether IT workers are ‘professionals’. Second, the literature may be studied to determine whether authors explicitly or implicitly refer to IT workers as professionals. Because they are new and largely unobserved by literature, the latter represents a paucity of sources, so the first method will be used.

Wynekoop and Walz (1998) make a critical distinction between varieties of IT workers, observing that their respondents were programmers, analysts, or managers – and that their psychological characteristics were slightly different. This is, however, only a beginning; further work needs to be carried out to reflect the range of work presently being carried out by IT workers. Along with programming, analysis, and management, other common disciplines in IT include the following – all of which are likely to be found among the IT workers at a school: hardware architecture, network design & building, information security, and system administration.

Benamati & Lederer (2001) asked IT practitioners about their job responsibilities. The following categories of activity emerged:

| | |
|-----------------------|--------------------------|
| Technology Evaluation | Applications Programming |
| Project Management | Team Leadership |
| Systems Analysis | Database Administration |
| Systems Design | Telecommunications |
| Strategic Planning | Systems Programming |

A dictionary definition of “profession”...

a paid occupation, especially one that involves prolonged training and a formal qualification (Oxford 2010)

...appears to grant IT workers the professional mantle, while Ramachandran & Rao (2006) and Guzman et al (2004, 2004a, 2007, 2008) explicitly refer to IT workers as professionals. Mylott (1986: 239) writes: “A malpractice cause of action for computer professionals is a logical extension of existing malpractice liability for other professionals.”

Apart from the taxonomic approach to professional status, IT workers could be evaluated using the same rubrics applied to other professions. Evans (2002) applies a professional model to teachers in American magnet schools, but that list can also be applied to IT workers, with the following values:

| Aspect of Work | Present in IT Occupation? |
|-----------------------------|----------------------------------|
| Autonomy: | yes |
| Professional development: | strongly yes |
| Salary: | maybe |
| Credentialing requirements: | voluntary |

The emphasis on professional development in technology is emphasised in Chase (2008: 136): "...this profession requires that workers continually retrain." Beyond post-secondary studies, IT workers have a wealth of industry certifications they may pursue. These range from entry-level courses on "how to use Microsoft Office" (Microsoft 2010) that may be pursued by secondary school students to extremely complicated and rare certifications such as the Cisco Certified Internetwork Expert – a ten-hour exam that requires rare and expensive test equipment. (Cisco 2010). This illustrates a high level of cognitive complexity inherent in some technology fields.

Connelly & Rosenberg's (2003) checklist of professional characteristics could be completed as follows for school IT workers.

| | |
|-----------------------------|--------------|
| Complexity of work: | yes |
| Lengthy induction period: | maybe |
| Ongoing growth: | yes |
| Specialisation & expertise: | strongly yes |
| Authority over own actions: | sometimes |
| Relatively high salaries: | maybe |

Although there is a strong case to be made for the professional status of IT workers, the salient issue is whether IT workers see themselves as having *some* claim to professional status – establishing the possibility of a conflict over status. If there is ambiguity over professional status amongst teachers or IT workers, then relationships might be fraught with confusion over relative status and roles. If IT workers are perceived to possess a higher status, then the teacher becomes a supplicant; if IT workers are perceived to pos-

sess a lower status, then the teacher becomes a supervisor. If there is disagreement over these roles, then conflict seems likely to occur.

IT workers at international private schools typically work in an environment where they have to attend to a variety of technical issues. Although some problems require advanced training and complex problem-solving skills, other issues are more pedestrian. Insofar as this latter variety of problem does not require “professional” skill, there may be multiple levels of status for IT workers, including some non-professional levels.

Salary complicates matters. Although the IT field has given rise to some of the world’s most recognised billionaires, IT workers are commonly local hires, drawing lower salaries and fewer benefits than teaching faculty. If salaries are a component of professional status (Connelly & Rosenberg 2003, Evans 2002), then IT workers at IPSes will have a diminished claim for professional status relative to the expatriate teachers at those schools.

A further question arises from perceptions of technical competence as a function of nationality. Except for Guzman et al (2007), all of the research on IT occupational culture cited in this review is based on conditions in the United States. Guzman et al establish that IT culture transcends national boundaries, but that does not illuminate how the teachers at international private schools (largely from North America, the UK, Australia, and New Zealand) will perceive IT workers from southeast Asia.

2.7 Occupational Prestige

Along with the professional status of the two occupations, relationships between teachers and IT workers will be mediated by perceptions of occupational prestige.

2.7.1 The Occupational Prestige of Teaching

Herbst (1989: 23-24) paints a bleak picture of the prestige of teaching in early North America:

The schoolmaster of colonial times rarely, if ever, basked in the sunshine of popular acclaim. ...

Drifters shunning hard physical labor and handicapped fellows unable to perform it sought out the schoolhouse as a place to sustain themselves

for a season. ...whether deservedly or not, common school teachers often ranked low in the opinions of their countrymen who were used to a hard and frugal life on the farm.

Waller (1961: 162) picks up the thread about a century later, writing in 1932 about teachers' lives:

The social standing of the profession is unfortunately low, and this excludes more capable than incapable persons. Particularly damaging, probably, is the belief that is abroad in the community that only persons incapable of success in other lines become teachers, that teaching is a failure belt, the refuge of 'unsalable men and unmarriageable women.'

Lortie (2002) adopts a gentler tone, but observes that the unstaged nature of a teaching career diminishes the maximum salary available to teachers. This flat salary structure, lacking a notable zenith, reduces the prestige of the occupation, according to a consistent series of findings by Duncan & Reiss (1961), Nakao & Treas (1994), and Ganzeboom & Treimann (1996).

While the occupational prestige of teachers increases with the age of their clientele, Nakao & Treas (1994: 47) and Tinsley & Hardy (2003: 2) show that even within the context of a university campus, there is professional "contempt" for those working in the faculty of education. This lack of prestige – although used to calculate socioeconomic indicator scores – precedes financial factors (Nakao & Treas 1994).

Again, the IPS context is different. The clientele of international private schools are typically diplomats and business managers who may generally have received more education, and therefore may place a higher premium on education than the domestic average – perhaps increasing the prestige of teaching. In addition, the specific venue at which teachers work may have an impact upon the realities and perceptions of prestige. Insofar as some IPSEs are acknowledged to be 'top tier' schools, teachers may 'borrow' some levels of their individual occupational status from their employing organisations.

However, because the IPS clientele typically comprise the upper echelons of business and politics, the **relative** levels of occupational prestige may be similar to those of their domestic colleagues.

Although national cultures are beyond the scope of this study, the Singaporean culture – largely Chinese in origin – is an inextricable part of the research site's milieu. Formal

research aside, a contemporary account of Chinese teachers is relevant:

...Ms. Zheng said she believed that teachers got little respect in America. “Teachers don’t earn much, and this country worships making money,” she said. “In China, teachers don’t earn a lot either, but it’s a very honorable career.” (Dillon 2010: 14)

2.7.2 Occupational Prestige of IT Workers

IT workers are increasingly visible in schools. Between 1980 and 2000, the number of school computers per capita in the United States increased 279-fold (US Census for 1980 and 2000, Goor 1981, allcountries.org 2006). Indices of occupational prestige and socioeconomic indicators (Reiss 1961, Ganzeboom & Treiman 1996; Nakao & Treas 1994) reveal a growing awareness of technology-related occupations among the general public.

Insofar as economic success is related to prestige (Duncan & Reiss 1961, Nakao & Treas 1994), data from Forbes (2008) is revealing: almost 7% of the world’s wealthiest individuals worked in “Internet”, “Software”, or “Technology”, rather than the other 25 industries, all of which have existed far longer than these three. Their wealth is newly minted or freshly transferred, rather than inherited. Also of note is the number of commonly-recognised names among these individuals. William Gates III, Lawrence Ellison, Jeffrey Bezos, and Steven Jobs may all qualify as “iconic”, even outside technology and business circles.

Where occupational prestige is concerned, teachers may proclaim their service to humanity. Although that claim cannot be made with the same conviction by IT workers, the potential for extreme wealth may lend IT workers some level of ‘borrowed’ socioeconomic glory – a glory manifestly missing from the teaching profession. The Forbes list does not feature “Education” as one of the industries engaged in by any of its billionaires. Instead, wealthy technologists make news by donating money to educators (Dopp 2010).

With the global visibility of these individuals, the once-pejoratives “nerd” and “geek” may be losing some of their stigma (Waters 2008, Cross 2005, Zimmer 2005). At the same time, Stanton et al (2006) show that an ability to transcend these stereotypes is an important aspect of a career in IT.

This study will be sensitised to the possible change in the status of IT workers. However, it may be possible that IT workers in this project face prejudice because of where they work (schools), the rewards they attract (relatively low), and the roles they play (supportive).

2.8 Occupational Culture

Hofstede defines culture as “the collective programming of the mind which distinguishes the members of one group from another.” (1980: 25) The research question of this study specified two separate occupational groups and their perceptions of relationships with each other. There is ample evidence in the literature to suggest that the occupational cultures of these two groups may give rise to conflict with negative impact upon the effectiveness of both occupations.

The cultures of both occupational groups in this study are marked by characteristics which reinforce their mutual isolation. In the case of teachers, this isolation is typically from each other as well as other occupational groups; IT workers appear to demonstrate far greater intra-occupational collegiality, yet are still isolated from other occupations.

2.8.1 The Occupational Culture of Teachers

Originally writing in 1932, Waller (1961) presents an early version of Huntley & Davis’ (1983) assertion that individuals are drawn to career choices that reflect their personal values and self-image.

Waller’s report of teachers is unflattering, and he notes that “the attempt to escape from the stereotype may itself become ... one of the important determinants of the occupational type proper.” (1961: 161), presaging Inlow’s (1956) comment about the desperation of teachers to assert their status as professionals: it may be that a discontent with professional status is a component of teacher culture. This is amplified in Hargreaves’ (1980) identification of “social status” as a major theme in the occupational culture of teachers. According to Elliott (1991), the stereotypes mentioned by Waller are reinforced by the induction processes that socialise neophytes into the occupation.

In reference to situations nearly two hundred years apart, Herbst and Lortie both note that teaching – for males – is not considered a suitable career among certain groups in the United States:

...young men who taught school in the seventeenth and eighteenth centuries usually did so while preparing themselves for more rewarding careers in the ministry, in public service, medicine, or business. (Herbst 1989: 21)

Most men reject teaching as an ultimate goal; they see teaching as a means toward another end – as an interim engagement. (Lortie 2002: 86)

Even before entering a discussion of culture, Hargreaves (1994) asserts that a key aspect of teaching is the existence of guilt, specifically caused by an inevitable inability to provide adequate pastoral care for their students. The desire to provide pastoral care, he says, is a motivator for teachers to undertake the occupation, particularly among teachers at the younger grades. This may have direct ramifications in terms of diametrically opposed occupational foci between IT workers and teachers, and indirect ramifications in terms of occupational gender. Ironically, Hargreaves notes, a deeply caring teacher who professes a concern for the emotional welfare of the students may suffer diminishing professional status.

2.8.2 Four Forms of Teacher Culture and A Test Case

Hargreaves (1994) argues that teacher culture has four chief forms: individualism, collaboration, contrived collegiality, and balkanisation. Each of these is eventually cast in a negative light – even those that initially appear positive. All four forms are affected by technology in schools, as will be demonstrated in the presentation of a simple test case: a teacher at an international private school chooses to conduct a lesson using a laptop computer, a video projector, and a website originally accessed from home. In this test case, the teacher is unable to send a signal to the video projector, the video projector will not start up, and the web site has been blocked by school security software.

Isolation: “Isolation for many teachers is the permanent state of affairs for their teaching; the base of their occupational culture.” (Hargreaves 1994). Waller (1961: 162-3) describes the teacher as one who “...rules over the petty concerns of children as a Jehovah none too sure of himself.”

The teacher’s professional prerogative to direct a lesson is an essential aspect of the occupation. Externally imposed content, milestones, and methodologies notwithstanding, the teacher is solely responsible for the conduct of the lesson inside the classroom. Although this may strengthen the case for professionalism, it also leaves the teacher at the mercy of chaotic elements.

In the test case, the teacher urgently requests assistance from the IT department, which dispatches an IT worker to the teacher's classroom. This dependence upon another individual of possibly lower perceived status may contribute to strained relations between the two occupational groups. When the IT worker enters the classroom, the isolation and empowerment of the teacher are compromised. The teacher's 'Jehovan' position in the classroom is diminished by the presence of another adult whose assistance is required to enable the teacher's lesson.

Collaboration and Collegiality: Hargreaves identifies collaboration and collegiality as positive forces leading to teacher development, arguing that teachers are able to learn from each other. Little (1990) separates these two broad terms into four discrete activities. For the purposes of the test case, Little's concept of "aid and assistance" is most applicable. *Prima facie*, as described by Little, "aid and assistance" does not have a large impact upon the teacher who makes such a request. However, the test case fundamentally alters the terms of engagement as conceived by both Little and Hargreaves.

The usual 'aid and assistance' situation takes place between two teachers in private; the teacher who is asked for advice will offer it the most gentle of terms:

Teachers with many years' experience, armed with well-formulated and well-grounded views on effective teaching, nonetheless refrain from advocating specific approaches even to beginning teachers. (Little 1990: 516)

Returning to the test case, the IT worker will turn on the video projector and configure the computer to deliver the appropriate video output. The conflict with teacher culture is threefold. First, the teacher becomes the supplicant while the IT worker takes control. This shift is pragmatic in the case of turning on the machines and making them function, but it is more deeply philosophical when the teacher must ask the IT worker to "unblock" the website. Second, the IT worker will probably try to explain to the teacher what to do next time, perhaps in a manner that demonstrates poor communication skills (Hornik et al 2002). Third, this interchange – which already violates teacher culture in two ways – occurs in full view of the students, further undermining the teacher's sense of control and mastery of the classroom.

Although rancour cannot safely be assumed to exist, it is possible that either or both participants will be unhappy about the situation. The teacher's lesson has been delayed, and some level of control has shifted from the teacher to the IT worker. Depending on the circumstances surrounding this hypothetical event, the teacher may be frustrated

by persistent failures in technology, while the IT worker may be frustrated by the teacher's inability to learn basic skills. The strained courtesies accompanying this exchange are a form of Hargreaves' "contrived collegiality" (1994: 203).

Balkanisation: Hargreaves (1994: 213-5) identifies four qualities of balkanised work environments: low permeability, high permanence, personal identification, and political complexion. However, Hargreaves refers to balkanisation within a single occupation, rather than that which might exist between the two occupational groups. As such, a strong level of balkanisation must be expected. This is doubly true in the context of international private schools, where disparate national cultures of teachers and IT workers may exacerbate divisions.

This level of balkanisation is reinforced by radically different professional vocabularies and different work schedules (as IT workers might work during teacher holidays). A further form of balkanisation resides in the geographic distribution of the two occupations. A full treatment of this issue is beyond the scope of this study, but a generality may be proposed that teachers operate in contexts different from IT workers. Where the former may be found in their own individual classrooms, relatively well-appointed teacher lounges, or staff work rooms, the researcher's observations suggest that the latter will more likely inhabit cramped quarters where visitors can't see them. Although this geographic separation is motivated at least in part by the occupational culture of IT workers (see next section), it reinforces the teachers' balkanisation – not only from their own occupational colleagues, but from other occupational practitioners as well.

2.8.3 The Occupational Culture of IT Workers

Whether or not IT workers constitute a 'professional' group, there is literature to support the suggestion that they form an occupationally-linked community.

Duliba & Baroudi (1991) were among the first to investigate the occupational culture of IT workers, finding that they did *not* form an occupational community. However, the prior existence of canonical documents of IT culture (see imminent discussion of The Jargon File) suggests that their research may have been incomplete.

Gerulat's (2002) study may have been the first to attempt to map the occupational culture of IT workers. His literature review does not mention any specific studies of IT workers; only documents regarding general occupational and organisational cultures. Gerulat's methodology merits two comments.

First, Gerulat's research participants all reported that their primary technical training

had been conducted privately in a 'self-study' environment, and all participants possessed at least 11 years of experience working in technology. Working backwards from the date of the study, that meant his participants had entered the field around 1990 – in the midst of the 'proliferation generation' alluded to in Chapter 1. Because they were self-taught, these practitioners were not formally (academically) socialised into the occupation and its culture. The culture they manifested may have been different from that of more recent practitioners who obtain university degrees with internships.

Second, only three of Gerulat's 20 participants were female: a 15% ratio, which was close to the 11% of females in the wider study population of 100 individuals. This is significant because of gender biases – which will be discussed shortly.

One of Gerulat's findings was that IT workers appeared to resent certain intrusions. This is subtly different from the teachers' eminent domain, because the IT workers were bothered when interference originated from somebody with inadequate *technical* knowledge. This implies a respect for skill as an occupational value. The teacher's desire for isolation, according to Hargreaves (1994), stems from the teacher's concern over personal adequacy; the IT worker's desire for isolation, suggests Gerulat, is based on the worker's concern over the *intruder's* adequacy. The teacher's self-doubt is the difference.

A further finding of the Gerulat study is the high value that IT workers ascribed to personal motivation and self-direction. This may be concomitant with the first observation on his methodology: participants must have been self-motivated to enter the field – either abandoning existing careers or expending additional effort to build a new track whilst travelling on another. This is also consistent with David Nielsen's observation (personal communication, 2009) regarding his entry into the field of educational computing, driven by personal interest rather than career demands or financial recompense.

Using Trice's (1993) work on occupational subcultures and Duncan's "group-grid" analysis (1982), Guzman et al (2004b) and Stanton (2006b) draw upon previous research (Duliba & Baroudi 1991, Gerulat 2003, Guzman et al (2004a)) to identify six manifestations of occupational community for IT workers.

Table 2.4: Manifestations of occupational community of IT workers

| Group dimension | Manifestations of IT occupational community |
|--|--|
| Esoteric knowledge and expertise | Proud of restricted IT skills and abilities; perceived high value of technical knowledge |
| Extreme and unusual demands | Need for constant self re-education; long hours; field for-ever changing; unsatisfied and/or angry users |
| Consciousness of kind | Boundaries between IT people and non-IT people, occupational membership |
| Pervasiveness | IT people predominate in non-work social community. Use IT in their leisure time. |
| Status, favourable self-image | Personal status, benefits of belonging to the IT occupation |
| Abundance of cultural forms (stereotypes, language, stories) | Stigmatised as nerds/geeks; shared stories about user mistakes and challenges of IT work; shared jargon; informal clothing |

Subsequent work by Guzman et al (2007) suggest that perceptions of IT occupations from *within* may transcend both gender and nationality – anecdotally confirmed by Raymond (2010). This is particularly important insofar as no IT workers in this research were from the United States, where all the other research was carried out. The study by Guzman & Stanton et al featured 95 participants; 55 of which were from Singapore or Malaysia.

Regarding Hargreaves' (1994) "balkanization" of occupations, Guzman et al (2008) observe:

...most IT personnel work in environments that have computer equipment and devices all around their desks/chairs, hubs, switches, and other machines covered with blinking lights, strongly air-conditioned offices, unused and spare hardware ... and in some cases hundreds of software boxes. Most of the IT settings we visited had an air of functional disorder: everything needed at hand but not in a rigidly organized way. (p 41)

This explains why IT workers may be found in cramped quarters hidden from public view and other occupational groups. However, IT workers interviewed by Guzman et al (2008: 41) do not experience *intracultural* balkanisation. They note "IT personnel spoke fluently, using their own unique vocabulary, about the tools and procedures as one way to share their work experiences."

Guzman et al (2008) concluded that IT workers *had* developed an occupational culture. They further concluded that “Conflicts between IT occupational subcultures and other extant subcultures arise from cultural differences.” adding that such conflicts “may impact the effectiveness of IT.” (2008: 33)

Ramachandran & Rao (2006) observe the presence of “few studies which discuss IS (information systems) occupational culture”, citing only four such references themselves. Their chief antecedent work is Guzman et al 2004a; their chief finding is “a preponderance of evidence to suggest that IS professionals form a sufficiently coherent community to have cultural characteristics of their own.” (p 204) However, they add:

We believe that a more complete understanding of the IS occupational culture requires a deeper and broader examination of the norms, beliefs and values among IS professionals, to be studied in conjunction with the norms, beliefs, and values of other professions. (Guzman et al 2006: 204)

Although the present study does not purport to study culture, it will use cultures as a means to understand perceptions of relationships between occupational subgroups within a single organisation. In this respect, it fills a clearly defined and previously acknowledged gap in existing research.

2.8.4 The Jargon File and Trains

According to a largely anecdotal Wikipedia entry (Wikipedia 2010), a computer-based text called The Jargon File was created in 1975 at Stanford and copied to MIT in 1976. The document has been updated several times under different leaders, and is currently still active (Raymond 2010). It contains an extensive glossary of slang as well as ‘articles’ on a variety of topics, including:

Hacker Slang and Hacker Culture³
Jargon Construction
Hacker Writing Style
Hacker Folklore

³ Raymond takes pains to distinguish a “hacker” as “(someone displaying) an appropriate application of ingenuity” from a “cracker: One who breaks security on a system.”

The Jargon File, therefore, is a guide to elements of the technology culture: not only specific interpretations of certain technologies, but also how members of that culture construct meaning. The document is irreverent and replete with “inside” jokes:

tail recursion: n. If you aren’t sick of it already, see *tail recursion*.⁴

To some degree, this illustrates the weak “grid dimension” identified by Guzman et al (2008). In an occupation characterised by “unrelenting change” (Chase 2008: 135), evolution will hinder the establishing of formal rules of conduct and strict hierarchies.

An aspect of hacker culture, as noted by Raymond in the Jargon File, is the notion of the “gift culture”: the individual’s standing in the community is influenced by what he gives away, rather than purely what he has.

Insofar as it purports to establish baseline meanings for slang used by IT professionals, the Jargon File strengthens the case for the professional status of IT workers. Hargreaves (1980) makes this point: the use of a specific vocabulary separates practitioners from others, increasing internal occupational cohesion and imparting inscrutability.

The third utility of the Jargon File lies in its provenance: MIT’s Tech Model Railroad Club, or “TMRC”. The Jargon File itself acknowledges the TMRC as one of the well-springs of hacker culture; Peter Samson (2010) first created the “TMRC Dictionary” in 1959. A close inspection of the dictionary will reveal numerous entries that were adopted into early versions of the Jargon file, as well as an unmistakable congruence of tone.

Prima facie, the connection between the TMRC and contemporary IT occupational culture may appear tenuous beyond the apparent coincidence of those two documents. Model railroads are not commonly regarded as “high tech”. However, certain abstract qualities of model railroads resonate with modern computer technology:

Design and construction of complex systems
Routing and switching
Sequential arrangement of objects and processes
Complete control over a ‘virtual’ world
“Engineering”

⁴ In tail recursion, the last statement of a function causes the function to call itself. For further clarification, refer the description of tail recursion in the text above.

The importance of the MIT Tech Model Railroad Club is further demonstrated in Lowood's (2009) description of *Spacewar*, a early computer game produced in 1962 by members of the TMRC.

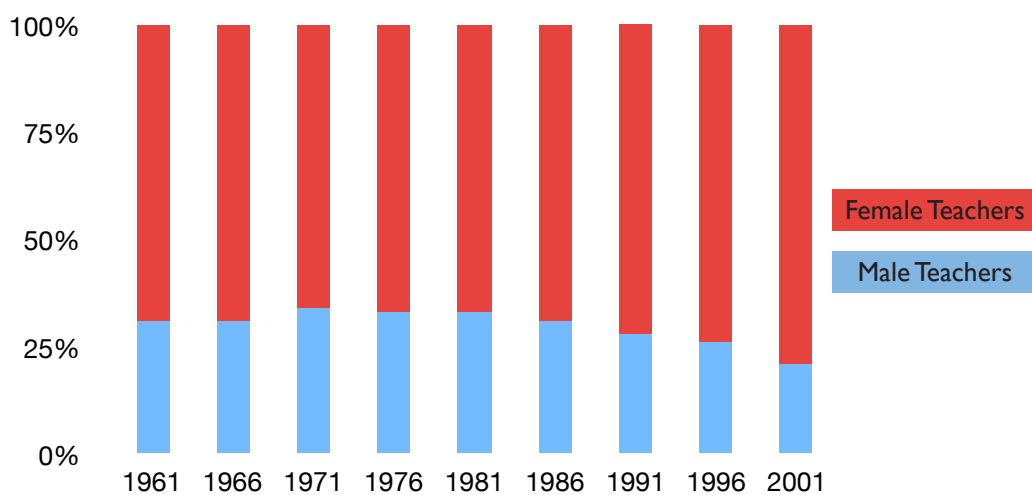
2.9 Gender Issues

Although Ehrenberg et al (1995) assert that gender, race, and ethnicity of teachers have little influence upon student performance, and although Guzman et al (2007) suggest that IT culture itself does not foster gender distinctions, gender may affect relationships between teachers and IT workers. Gender is not an explicit focus of this study, but it plays a powerful role in both occupations: each is strongly and almost identically skewed in opposition to the other.

2.9.1 Gender in Teaching

Teaching is a predominantly female pursuit, though this varies according to academic level and type of school. According to statistics from the US National Center for Education Statistics (Snyder et al 2004), the gap between numbers of female and male teachers in the United States widened from 38% in 1961 to 58% in 2001.

Figure 2.3: Proportion of teacher genders in the US, percentages by year



Smith (1999) reports data from the Australian Bureau of Statistics showing a pattern in Australian primary schools similar to that seen in Figure 2.5: a gradual decline from 30% male in 1984 to 23% in 1998. In Australian non-government primary schools (analogous to 'private' schools elsewhere), the percentage of male teachers in Australian

government primary schools was consistent between 1984 and 1998 – varying by less than one percentage point from an average of 21.9%.

With reference to Europe, Ammermueller et al (2003) observe that 80% of teachers in Eastern European transition countries are female. Lahelma (2000) puts the number in Finland at “more than 30%” in primary schools – with the implication that the number is also less than 40%. A report examining trends from across 25 European countries in 2008 (Eurostat 2008) echoes these findings: 68% of all primary and secondary teachers are female.

As in the Australian examples, additional observations emerge when figures from the United States for 2003-04 are separated along elementary, secondary, public, and private school boundaries. (US NCES 2007). Figure 2.5 (following page) illustrates this.

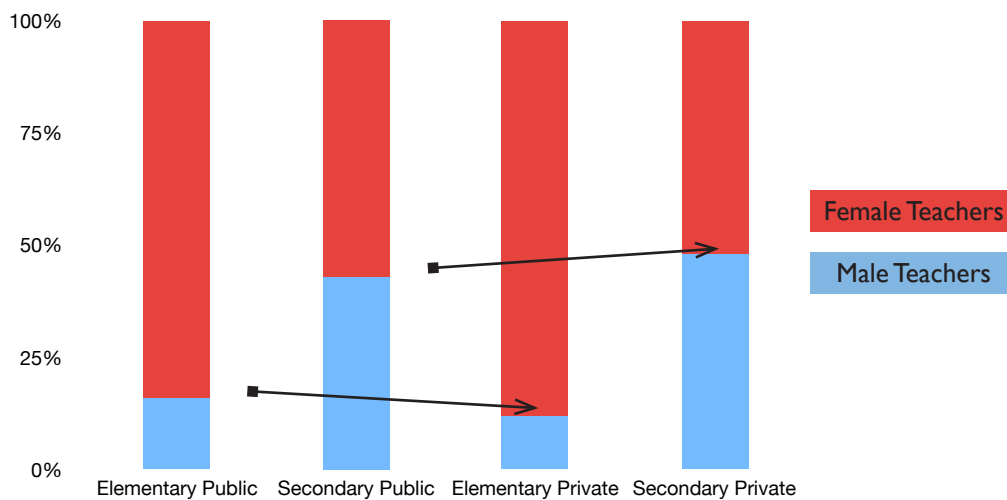
First, elementary schools are overwhelmingly dominated by female teachers, while secondary schools are more balanced between genders. Second, private schools manifest both trends more powerfully than public schools: elementary private schools are “more female” and secondary private schools are “more male” than their public counterparts.

It must be noted that “private” schools in the United States are not necessarily synonymous with the “international private schools” in this study. Acknowledging previous observations on the difficulty of defining “international schools”, $\frac{3}{4}$ of all private schools in the United States have some type of religious affiliation (Broughman 2008). However, insofar as they are comparatively unencumbered by government oversight and labour unions (Schleifer 1998, Figlio & Stone 1997), independent, private schools may be generally more responsive to client pressures than their public counterparts.

The implications for the first point is that gender-related issues may not be distributed evenly across grade levels in the school. If IT workers are perceived as ‘interlopers’ into the teacher’s domain, then a gender-polarised environment may exacerbate tensions. By the same token, in a gender-balanced environment, the gender of any specific IT worker may be unremarkable in terms of the teacher population. The matter of gender distribution among IT workers will be examined shortly.

The second point affects the transferability of the study. If current private-school patterns are later echoed – perhaps in muted fashion – by slower-moving public institutions, then this study offers an insight into a set of conditions that may be more subtly enacted on a broad scale.

Figure 2.4: Proportion teacher genders in the US, percentages by school type



In a discussion of “caring” in “Gender and Teachers’ Work” (1995), Acker conflates maternal feelings and pastoral ‘caring’, with a focus on the elementary (primary) level.

Teachers’ caring activities, then, have from one perspective been seen as derived from their teacher identities and the nature of their work; from another, as a valued part of “women’s ways”; from a third, as a means to improve childrens’ futures; and, from a fourth, as a consequence of the social expectation that women’s caring work should blur the distinction between labor and love.” (p 124)

Beyond Acker’s social politics lies the assertion that lower levels of education are characterised by a greater degree of emotional care – a kind of ‘empathising’ – more commonly associated with women than men.

The issue of gender is also relevant when considering the implications of level of teaching and occupational prestige. The female bias towards empathy reinforces Baron-Cohen’s work on “male-brain” behaviour (2002), and is further validated – in converse – when considering gender distribution in technology-related fields of study and work.

2.9.2 Gender in IT

The very existence of a web site called “Nerd Girls” is an early indicator that gender is an issue in technology. Created by Professor Karen Panetta at Tufts University, the ‘Nerd Girls’ movement aims to “encourage other girls to change their world through

Science, Technology, Engineering and Math, while embracing their feminine power.” (Nerdgirls 2010)⁵.

Cumming (1997) offers suggestions to increase women’s participation in engineering studies, explicitly beginning from the standpoint that “it is in both women’s and the world’s interests for women to participate in the work force equally with men”.

Statistics regarding the participation rates of women in post-secondary technology studies validate the concerns of Cumming and Panetta. Data from the US National Center for Educational Statistics (Aud et al 2010) show the magnitude of gender polarisation between the two occupations:

Table 2.5: Gender distribution of graduates in the United States

| Degree | Grads | % Male | % Female |
|--|--------|--------|----------|
| Engineering | 83853 | 83 | 17 |
| Computer & information sciences | 38476 | 82 | 18 |
| Physical sciences and science technologies | 21934 | 41 | 59 |
| ... 12 rows omitted ... | | | |
| Psychology | 92587 | 23 | 77 |
| Education | 102582 | 21 | 79 |
| Public administration and social service professions | 23493 | 18 | 82 |
| Health professions and related clinical sciences | 111478 | 15 | 85 |
| Family and consumer sciences / human sciences | 21870 | 12 | 88 |

The preponderance of males in IT coincides with Baron-Cohen’s theory of “extreme” male brains: “systemising is hyper-developed whereas empathising is hypo-developed” (2002: 249). While Baron-Cohen cautions that women can have “male brains”, he asserts that *more* males than females have an extreme male brain.

Both occupations manifest diametrically opposed gender distributions: teachers tend to be female – overwhelmingly female in primary schools where greater empathising is expected (Acker 1995) – while IT workers are overwhelmingly male.

Moving from college enrolments to career choices, the US Department of Labor (US DoL 2008: 28-29) notes that women accounted for 56% of all employees in “Professional and related occupations”. By contrast “Computer and mathematical operations” featured only 25.6% women. This demonstrates the “maleness” of the IT field, par-

5 The automatic content filtering system at the researcher’s international private school blocks access to the nerdgirls site, placing it within the “Adult/Sexually Explicit” category.

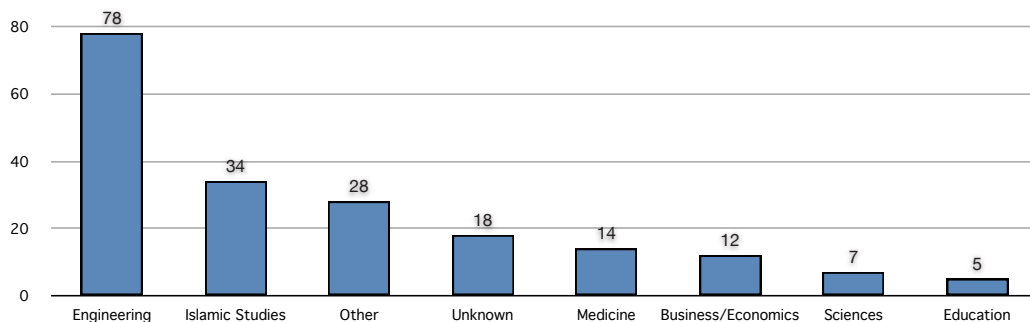
ticularly in comparison with other professions. Triangulating the literature, the Department of Labor data specify that women make up 73% of the “Education, training, and library occupations” group – consistent with numbers obtained from the US NCES. The Eurostat data corroborates the gender trend in technology. Across the 25 countries of the EU, women dominate in “Health and Welfare” and “Education”, while men dominate “Engineering” and “Science, Maths, & Computing” (Eurostat 2008).

In conclusion, as strongly as teaching is a female profession, so is IT dominated by males – a finding which appears to hold in the United States, Europe, and Australia. The two professions occupy diametrically opposite ends of the gender spectrum, which could by itself lead to inter-occupational friction. Gender may also be inextricably enmeshed in both occupational cultures.

2.10 Occupation and Security

The distribution of genders between the two occupations covered in this study has been shown to be a diametrical opposite. A further diametry exists between the two occupations. Gambetta & Hertog (2009) searched for educational histories of 404 members of violent Islamist groups worldwide, finding suitable data for 326 of them. Of these individuals, 196 had undertaken higher education.

Figure 2.6: Fields of advanced study among violent Islamists



Gambetta & Hertog argue that engineers are over-represented because of a combination of social difficulties faced by engineers in their home countries and “*engineers’ peculiar cognitive traits and dispositions*” (p 213). Specifically, they argue that engineers are likely to be attracted to political philosophies which offer “cognitive ‘closure’ and clear-cut answers as opposed to more open-ended sciences...” (p 221).

Insofar as “engineering” and “computing” share an extreme end of the occupational spectrum, this information has at least one striking implication: IT workers (as a variant of engineers) may be deeply divided from teachers on some fundamental psychological level.

Chapter 3. Methodology

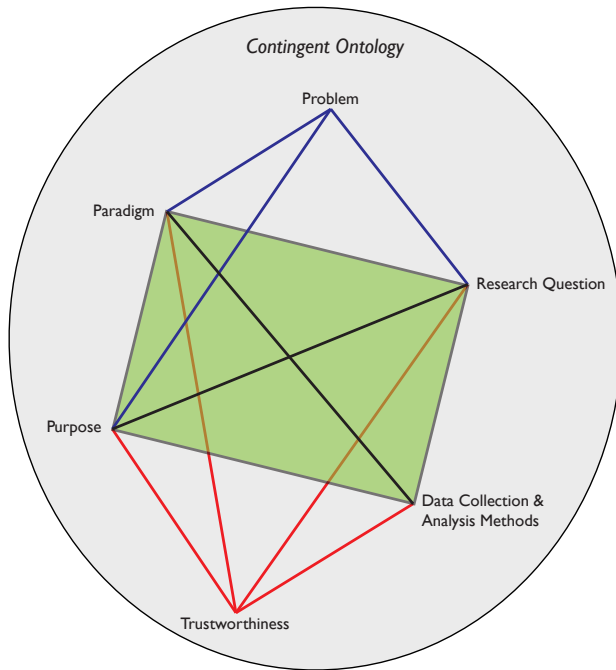
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This study set out to learn how IT workers and teaching faculty at an international private school in Singapore perceive their respective relationships. Three specific research questions were:

1. How do IT workers and teaching faculty regard their own professional status and that of their counterparts?
2. In the views of participants, what is the relative prestige of IT and teacher occupations?
3. How do participants from each occupation see the relationships between the two occupational cultures?

This chapter will reveal how those questions were answered. Before that, however, a research model will be presented which shows how the questions themselves presuppose the answer, and how aspects of the research design imply each other – a phenomenon termed *interdefinition*.

Figure 3.1: Relationships between research elements



3.1 Design Models

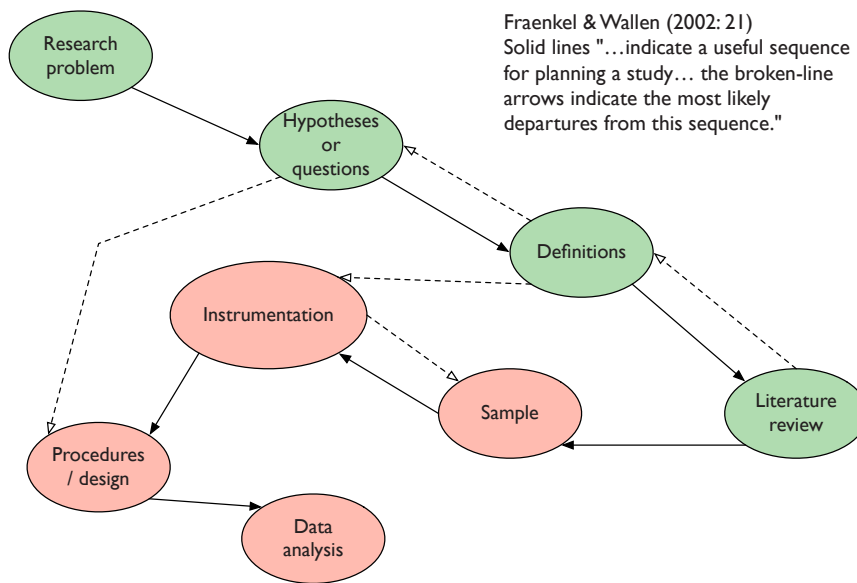
Although the problem and the research questions were originally presented in isolation in Chapter 1, they were co-developed with other facets of the research process.

The research process consists of several well-delineated activities sometimes occurring in a sequential order. Although modelling this process results in artificially simplified views of activity, the modelled process is more easily discussed and critiqued.

This study was holistically designed using the model shown in Figure 3.1. Each aspect of that model related to other aspects to achieve conceptual congruence: “A good design framework will have high compatibility among purposes, theory, research questions, methods, and sampling strategy.” (Robson 2002: 82)

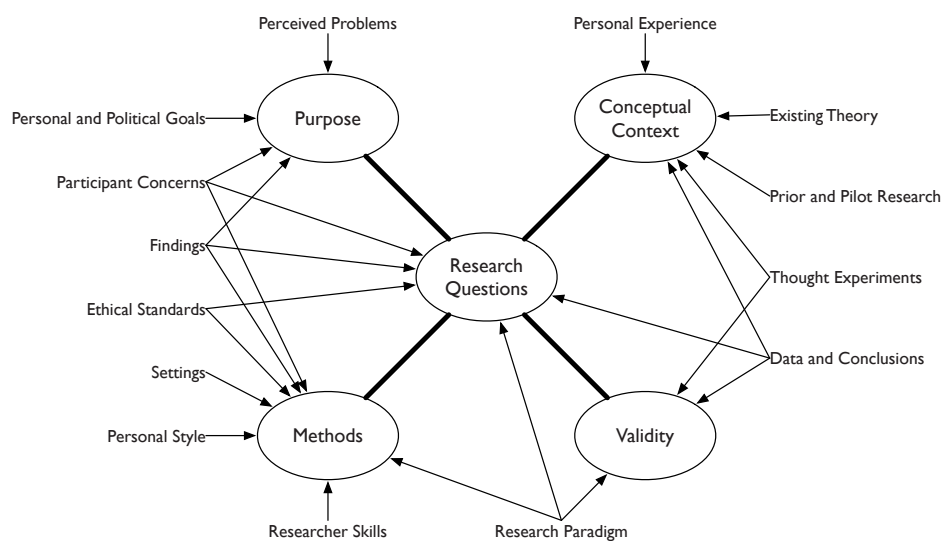
The model in Figure 3.1 is different from that proposed by Fraenkel & Wallen (2000: 21), reproduced in Figure 3.2. Although they grant that “experienced researchers often consider many of these components simultaneously as they develop their research plan”, the model is essentially non-recursive in its movement toward data analysis.

Figure 3.2: Fraenkel & Wallen's research model



Maxwell's model of the research process (cited in Gall, Borg, & Gall (2003) and shown in Figure 3.3) is more similar to the model used in this study. Maxwell's model places research questions in a central position with four key 'satellites'.

Figure 3.3: Maxwell's research model



The model presented in Figure 3.1 shows a "contingent ontology" that provides an existential locus for the research act. The seven qualities of the research are illuminated by the light of an epistemological viewpoint. Each of these seven research facets and the two contextual qualities will be discussed as they pertain to this study.

3.2 The Contingent Ontology

Ontology is here regarded as the manner in which things may be considered to exist. This study considered two interacting occupational groups and asked, “How do they get along with each other?” Any answer requires an ontological position.

If the answer involves a quantitative analysis of some information, then an objective or positivist ontology would be suitable: qualities could be found which convey common meaning to all participants, and quanta of those terms could be measured. However, the lack of existing theory in the field of study casts doubt upon any specific choice of what might be measured and what quanta might be employed. Without some prior validated understanding of teacher-IT worker relationships, any choice of qualities and quanta would be arbitrary.

This research specifies an interest in social reality: intangible relationships with individually-constructed meanings and intangible perceptions of those relationships. A constructivist or post-positivist position – amenable to the existence of intangible things – is more appropriate than an objectivist approach. This deliberated ontological choice is consistent with Robson’s “critical realist” approach: “...use whatever philosophical or methodological approach that works best for a particular problem at issue.” (2002: 43) An interpretive position was fully adopted and allowed to inform other choices in research methodology, avoiding the risk of theoretical ambiguity implied by Mason: “...you cannot simply pick and choose bits of one and bits of another (ontology) in an eclectic or ad hoc way.” (1996: 14)

3.3 Epistemology

As ontology establishes what things may exist, epistemology describes how individuals may understand those things. In this study, epistemology was relevant in terms of the researcher as well as research participants themselves. Weber (2004) asserts that positivist epistemologies assume that the researcher can be abstracted from the field of study, reporting impassively and without intrusion upon a single, observable reality. This may be plausible when the material under study is simple, reproducible, and quantifiable.

However, this study is one of social reality, where participants describe their perceptions of themselves, each other, and their relationships. Denzin & Lincoln assert that

the researcher cannot abstract himself from the study and report it in purely uninvolved terms: “The age of value-free inquiry for the human disciplines is over...” (1994: 12)

Even if the researcher could be ‘objective’, the participants themselves would still be functioning in a subjective world where they perceive, interpret, and act upon individual interpretations of reality. Design coherence would appear to favour the adoption of an epistemological standpoint that accepts the existence of multiple realities individually constructed by participants. This pragmatism is supported by Altheide & Johnson (cited in Robson 2002: 168), who advocate elegance, coherence, and consistency as evaluative criteria for qualitative studies.

3.4 The Problem

This study began with an observation made by a headmaster of occupational cultures of IT workers (see ; this is consistent with Brizuela et al (2000: xviii): “Qualitative researchers begin with a question they want to answer, a problem they want to explore, or a situation they choose to change.”

Assuming a consistent ontological and epistemological genesis, the problem can be fixed as a starting point: IT staff and academic faculty are required to coexist within the organisation; since they represent different occupational groups, how do members of both groups cope? This problem leads to purpose, research question, and paradigm. As shown in Figure 3.1, directional arrows show that the problem is unlikely to be changed in the face of the other six research facets. Changing the problem would be tantamount to beginning a new study.

3.5 Paradigm

Lincoln & Guba (1985) elevate the naturalistic paradigm to a position of pre-eminence, dictating both ontology and epistemology. This discussion of paradigm, by contrast, is constrained to the research paradigm, and it exists *within* the contexts of ontology and epistemology.

The investigation of ‘unreal’ and ‘directly unmeasurable’ phenomena is enabled by an ontological position that grants the existence of perceptions of relationships between occupational groups. A quantitative study could be undertaken, aiming to discover how many occupational practitioners thought they had certain types of relationships with each other. However, such a study – based on quantitative principles and a posi-

tivist paradigm – would be at odds with its own phenomenologically oriented underpinnings. Furthermore, a quantitative study requires that variables be named and defined *a priori*. In the absence of extant research, such variables would be arbitrarily and preemptively defined prior to fieldwork. At that point, even a perfectly-executed study could result in the discovery of a misleading or meaningless scalar.

By contrast, a qualitative methodology – with its sensitivity to context and its recognition of subjective reality – is more congruent with the established ontological and epistemological foundations. The qualitative researcher, note Taylor & Bogdan (1998: 8), “...looks at settings and people holistically: people, settings, or groups are not reduced to variables, but are viewed as a whole.”

Qualitative research will enable direct observation and analysis of non-physical phenomena that act upon human perceptions and interactions without the filtering of contrived “operational definitions or rating scales” (Taylor & Bogdan 1998: 9).

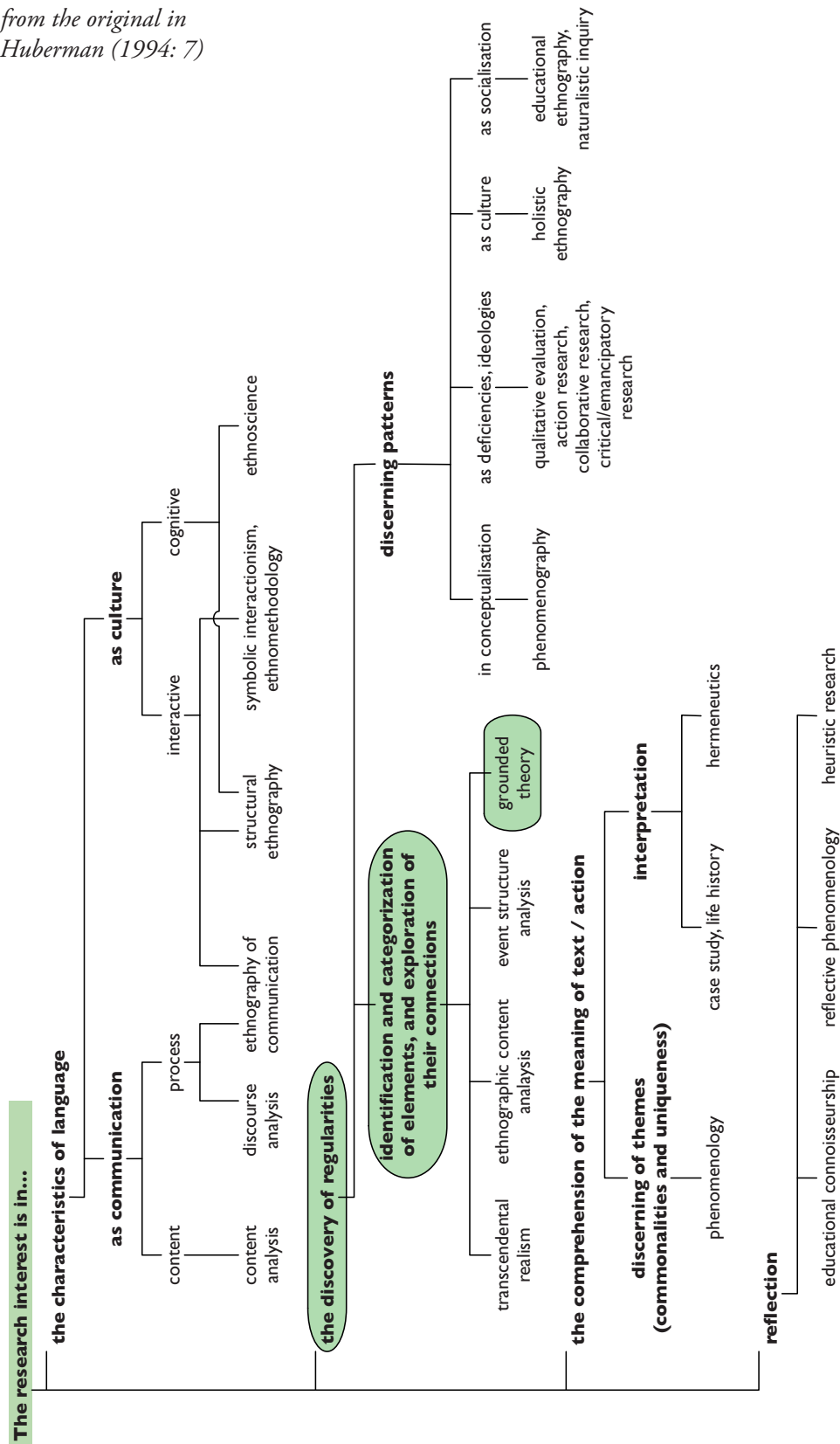
The subcategory of qualitative research is influenced by the literature review, which discovered that little work has been done in the area of interactions between teachers and other occupational groups. Miles & Huberman (1994: 7) provide an overview of qualitative research types, using Tesch (1990) as a source. In their presentation of types (see Figure 3.4), the study of new situations appears to be best served by “the discovery of regularities”, rather than characterisation, textual comprehension, or reflection.

Both criticalist and feminist perspectives are complicated by the absence of prior research into the relationships involved in this study. Carspecken (1996: 7) promises that criticalists will find inequality and oppression, but it is not clear precisely who would be oppressed in this context. A case could be made that technology – as a male-dominated field – is asserting increasing and oppressive control over education – a venue that has long been dominated by women. According to a Eurostat report (Eurostat 2008), 7 of 10 fields of university study are dominated by women; computing is one of only three fields where men still hold a majority position. In terms of relative numbers, then, the male IT workers are under threat from the female teachers. In addition, teaching – the traditional domain of women – is the incumbent occupation in the school environment; one cannot blithely assume that the newcomers – a small number of men in a nominally supportive role – will oppress their female counterparts.

Similarly, varieties of research that involve the discerning of patterns presuppose a basic understanding of the field of inquiry – an understanding that does not sufficiently ap-

Figure 3.4: Qualitative research types from Miles & Huberman (1994)

*Adapted from the original in
Miles & Huberman (1994: 7)*



ply to the present study. Although the researcher spent several years observing behaviour between IT workers and teachers in international private schools, this background was strictly informal, with insufficient rigor to engage in a formal declaration of patterns. Instead, this study set out to accomplish the "...investigation (and categorization) of elements, and exploration of their connections." (Miles & Huberman 1994: 7)

Grounded theory methods were the best fit, permitting the researcher to begin to map the yet-unknown topology of relationships between IT workers and teachers. Woods (1985: 57) cautions that 'grounding' may be superfluous in situations where a number of prior studies have sounded the depths of a given field. However, this field of study presents the converse situation: grounded theory methods are suited to the creation of new learning in unexplored fields.

Because grounded theory methods generate hypotheses during the study rather than *a priori*, they allow the flexibility required to study the field without imposing a contrived theory that might not be validated by observed reality. Janesick (1994: 218) notes:

"Data collection, analysis, and theory are related reciprocally. One grounds the theory in the data from statements of belief and behavior of participants in the study."

Consistent with Strauss & Corbin (1998) and McMillan (2004), aspects of the research design were refined throughout the study in response to emerging concepts. These are discussed in greater detail in Chapter 5. These refinements included modifications to the interview schedule, the folding of new findings into existing lines of inquiry, and changes to the anticipated interview sequence. Grounded theory methods, therefore, were part of the fieldwork as well as the analysis.

3.6 Purpose

Driven by the problem, the purpose of the study cannot be established without simultaneous and reflexive reference to other research elements: a study cannot seek things if they cannot exist according to the ontology, and the mechanism of the paradigm must enable the discovery of what is sought.

Robson's "compatibility" (2002: 82) effectively ruled out certain types of purpose. For example, a search for the *number* of IT staff who feel they are misunderstood would drive the study toward positivism – partly because positivism is more congruent with quantitative work, and also because such a search sets out an *a priori* hypothesis.

To maintain congruence with ontology, problem, and paradigm, the purpose of this study was to investigate perceptions of relationships between IT staff and academic faculty.

3.7 Symbolic Interactionism

Symbolic interactionism has already been discussed with respect to an analytic framework in the context of the literature review. It also carries relevance with respect to methodology because it informs both data collection and analysis.

Blumer (1956: 686) notes:

“As human beings we act singly, collectively, and societally on the basis of the meanings which things have for us. ... In our activities we wend our way by recognizing an object to be such and such, by defining the situations with which we are presented, by attaching a meaning to this or that event, and where need be, by devising a new meaning to cover something new or different.”

The reality of each participant, therefore, is an individually-realised construct. As Hofstede laments, “...we cannot directly observe mental patterns. What we can observe is only behavior, words, or deeds. When we observe behavior, we infer from it the presence of stable mental programs.” (Hofstede 1980: 14).

Blumer (1969) establishes three essential principles governing the self and how individuals interact with each other:

1. Individuals act toward things based on the meanings that they impart to those things
2. Meanings are established through social interactions, and
3. Meanings are individually manipulated and modified.

Goffman's extension of symbolic interactionism (1959) adds:

4. The individual deliberately presents a “self” to others.

The interview schedules prepared for reference during semi-structured interviews reflect an awareness of these four observations of human interactions and the quest to discover evidence of mental programs.

3.8 Grounded Theory Methods in Data Collection and Analysis

Although grounded theory is an element of paradigm, it also affects data collection and analysis since it dictates the relative timing of these two facets of the research process – as well as the manner in which hypotheses are formed.

As a general comment upon qualitative methods, Lincoln & Guba (1985: 39) describe the value of grounded theory and incidentally cast all naturalistic research as an implementation of grounded theory:

The naturalist prefers to have the guiding substantive theory emerge from (be grounded in) the data because no *a priori* theory could possibly encompass the multiple realities that are likely to be encountered; because believing is seeing and the naturalist wishes to enter his transactions with respondents as neutrally as possible... and because grounded theory is likely to be responsive to contextual values.

The practical implications of grounded theory methods lie in the realm of data collection and analysis: hypotheses are developed within the milieu of the study itself, arising from analyses carried out during, between, and after episodes of data collection. As Strauss and Corbin (1998: 23) note, grounded theory does not begin with a hypothesis to be proven or disproved, but rather "...begins with an area of study and what is relevant to that area is allowed to emerge."

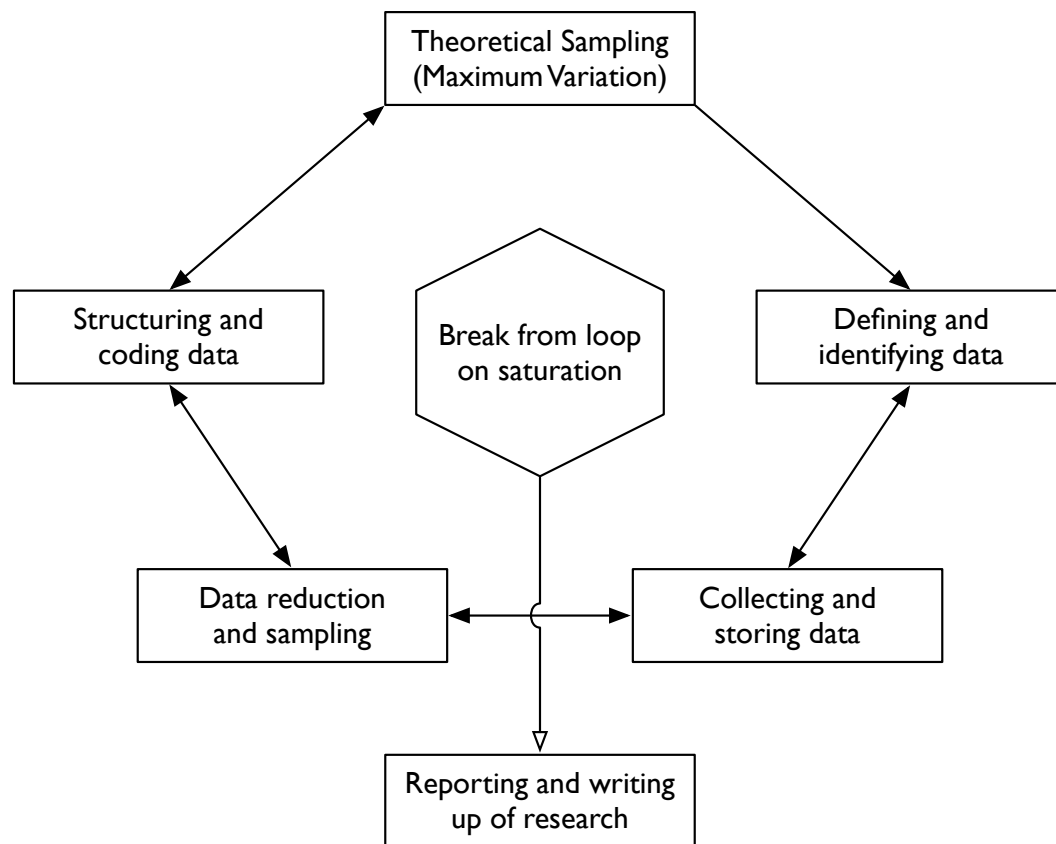
3.9 Data Collection

Borrowing elements of process schematics from Watling (in Coleman & Briggs 2002) and Lincoln & Guba (1985), data collection is illustrated by the model in Figure 3.5.

The primary source of data was a bank of interviews conducted with 19 participants: five IT workers, twelve teachers, a former IT worker, and the technology manager. Observations were used as context and occasionally contributed to interview questions, but did not constitute formally analysed sources.

All IT workers at the site were interviewed, except one who refused repeated requests for participation. After obtaining permission, all interviews were recorded except one IT worker – during and after which notes were hastily made.

Figure 3.5: Data collection in the research model



3.10 Definition of The Case

Although Bassey (2002) and Tesch (in Miles & Huberman 1994) treat “case study” as a method, this study adopted the more restricted definition presented by Stake (1994): “case study” delimits the physical boundaries of the inquiry. Lincoln & Guba (1994: 357) describe case study as “the mode of choice” for naturalistic work.

Stenhouse (1985: 265) distinguishes case study from sample-oriented research, noting that sample-based research attempts to “establish by calculation the relationship between a sample studied and a target population to which the findings in the sample are to be generalized.” Although a specific sampling strategy was critical to the study, its purpose was not to obtain a calculable relationship to a target population. Nearly all IT workers were interviewed, while fewer than 10% of the teachers were interviewed: both represent unworkable statistical extremes.

Therefore, Stenhouse’s ‘geographic’ interpretation of case will be used in this study: a single case, represented by the single organisational context of Bluesburg school. The relationships documented in this study are aspects of that single case.

Within the Bluesburg context, four different types of relationships were identified *a priori*:

- | | | | |
|------|-------------|---|----------------------------|
| I. | 1 teacher | – | 1 or more named IT workers |
| II. | 1 teacher | – | IT workers in general |
| III. | 1 IT worker | – | 1 or more named teachers |
| IV. | 1 IT worker | – | teachers in general |

The discovery of type I and III dyads led to efforts to obtain reciprocal views. This will be discussed in greater detail in a subsequent section on Sampling.

3.11 Choice of Research Venue

3.11.1 Choice of Singapore

Beyond being the researcher’s home, Singapore was a good location for the study. With four major societal cultures (Chinese, Malay, Indian, and European), Singapore is neither monocultural nor overtly hostile to minority cultures. Some effects of national cultures are further reduced by Singapore’s status as a developed country. Although each culture is associated with one or more languages, English is linguistically dominant. Because IT workers will tend to be host-country nationals, the common use of English will reduce communication challenges. Finally, with a large number of international private schools, Singapore offers a breadth of IPS contexts for the research.

3.11.2 Choice of International Private Schools

The choice of international private schools as a research venue has already been touched upon. These schools are typically agile, well-funded, and – due to competitive pressures – responsive to evolutionary changes in education. Using data from a variety of publicly-available sources, four schools were identified as candidate venues¹. Parameters established by Hayden (2001), Cambridge (2001) and Ellwood (2007) nominate all four as “international private schools”, though they do manifest characteristics that place them at different locations on various axes of analysis.

¹ To preserve confidentiality, sources of this data and exact characteristics have been omitted.

Table 3.1: Characteristics of candidate schools

| Characteristic | Redville | Bluesburg |
|-----------------------|--|--|
| Teacher demographics | Very homogeneous; 85% of faculty members are expatriates from one country. | Very heterogeneous; the dominant expatriate group < 60% of the teacher population. |
| Size | Medium (< 150 teachers) | Large (> 200 teachers) |
| Financial orientation | For profit | Non-profit |
| Governance | Self-governed; based in Singapore | Part of an international group of schools |
| History | about 20 years old | local branch > 30 years old |
| | | |
| Characteristic | Greentown | Whitehouse |
| Teacher demographics | Very homogeneous; 90% of faculty members are expatriates from one country. | Heterogeneous; the dominant expatriate group = ~60% of the teacher population. |
| Size | Medium (< 150 teachers) | Small (< 50 teachers) |
| Financial orientation | non-profit | For profit |
| Governance | Self-governed; based in Singapore | Part of an international group of schools |
| History | over 50 years old | local branch > 30 years old; |

All four schools were contacted with requests for research access. The headmaster at Redville was amenable to the project, but his governing Board of Directors refused access. The headmaster at Whitehouse also declined to have his school participate.

Bluesburg initially refused, but subsequent efforts yielded permission to proceed; Greentown also granted permission. The study was started at Bluesburg, with the original intention that Greentown would then be studied in contrast to emerging findings at Bluesburg. However, the complexity of the situation “in the field” was such that the entire study was based on Bluesburg; adding a second research site might have added breadth, but the depth of study at Bluesburg would have been compromised.

3.12 Sampling Strategy

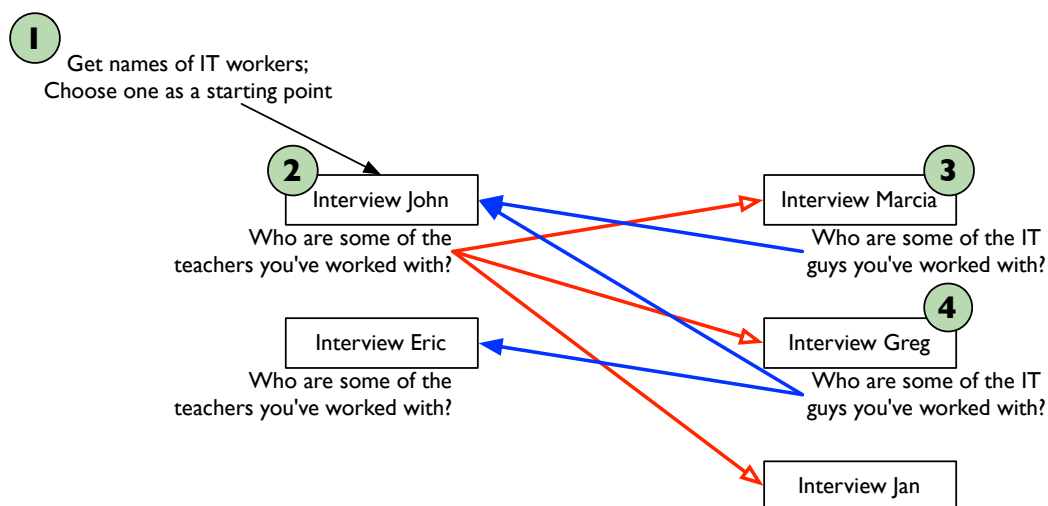
With respect to Stenhouse's (1985) observations regarding case-based and sample-based research, this study was not intended to establish a calculable relationship between the participants in this study and the global population of similar people.

Sampling strategies are described in Gall, Borg, & Gall (2002), Robson (2002), and Taylor & Bogdan (1998). Within logistical constraints imposed, it was not reasonable to attempt the generalisation that might accompany a search for an 'average' case.

However, it was plausible to employ a form of theoretical sampling. Insofar as this study sought to sound the *range* of relationships as perceived by participants a "maximum variation" sampling strategy was chosen. This choice permitted the process, as described by Glaser & Strauss (1967), of choosing research participants *in situ* as a response to incoming information.

A conventional snowball sampling technique (Gall, Borg, & Gall (2002); Cohen & Manion (1994); Taylor & Bogdan (1998)) involves starting with plausible informants or opportunity samples and asking them to nominate others along lines of relevance to the research interest. The objective of such techniques is to discover "...the range of variation... and to determine whether common themes, patterns, and outcomes cut across this variation." (Gall, Borg, & Gall 2002: 179) In this study, the focus on relationships required a shift from a conventional monadic snowball to a dyadic snowball, illustrated in Figure 3.6.

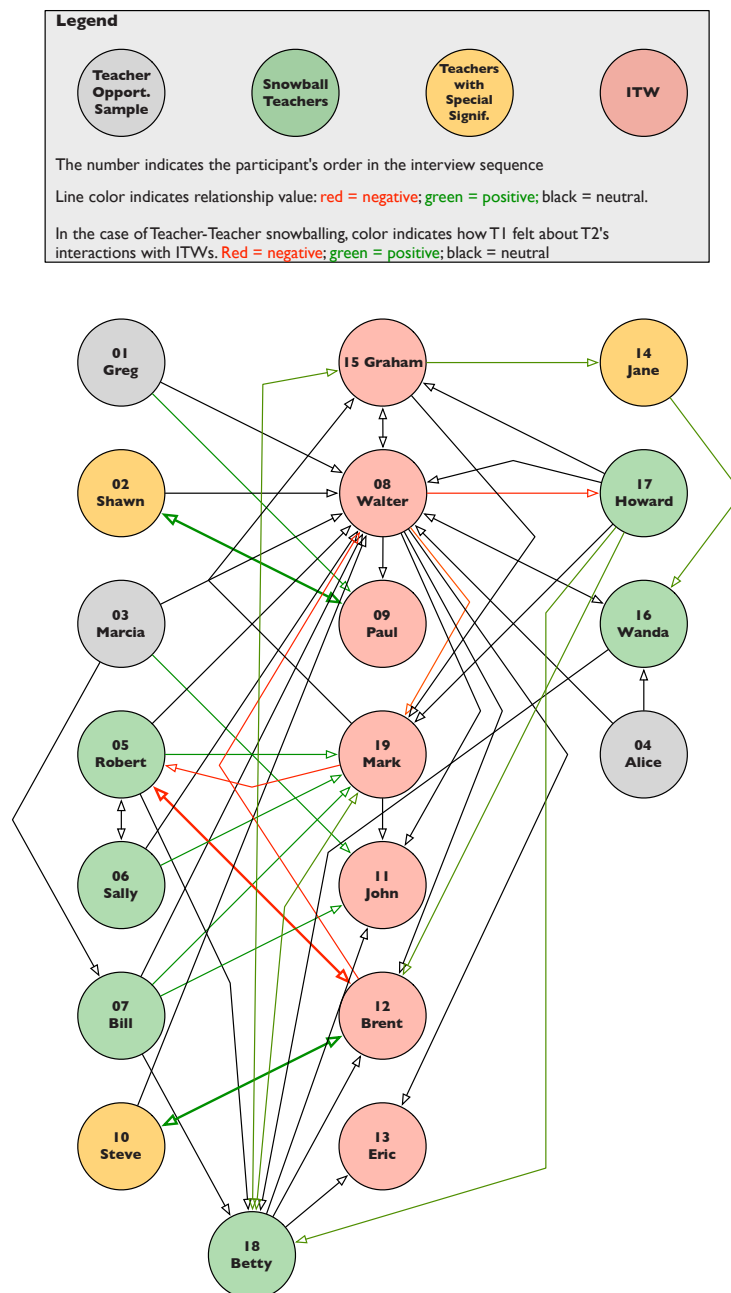
Figure 3.6: Dyadic snowball in theory



Each IT worker will typically interact with many teachers, while most teachers will interact with only a few IT workers. As a result, it was decided to interview a number of teachers before engaging the IT workers, and then focus on the IT workers, eventually returning to teachers.

Initially developed as a theoretical construct, the dual-snowball technique was validated in pilot interviews and proved to be an effective means to carry out the study. In practice, the final network of participants was as shown in Figure 3.7.

Figure 3.7: Final snowball structure



3.13 Semi-Structured Interviews

Interviews are categorised into roughly three types: structured, semi-structured, and unstructured (or “open”).

Structured interviews can be regarded as a variety of survey or questionnaire, conducted by a researcher rather than delivered on paper. Opportunities for open-ended questions are limited by the implicit requirement that all participants should be asked the same questions. Having a researcher administering the survey allows ambiguities to be resolved immediately. For this study, a structured interview is inappropriate for the same reasons that quantitative methods might be inadvisable: the establishing of a rigid question sequence with fixed probes and inflexible phrasing assumes that relevant questions can be asked before the topology of the field is apprehended.

Hofstede (1980) and Lortie (2002) show that surveys and structured interviews can reveal complex sociological truths. However, both Hofstede and Lortie knew what they were seeking prior to the development of their respective research instruments: they wanted to know what percentage of their participants held a particular view defined by the researcher’s question. By contrast, the present study does not dictate a syntactic framework within which participants are expected to articulate their realities.

Gall, Borg, & Gall (2003: 239) describe the unstructured interview as an informal conversation in which there is a “...spontaneous generation of questions in a natural interaction, typically one that occurs as part of ongoing participant observation fieldwork.” The main reason for avoiding this type of interview was that the researcher was worried about the possibility of losing focus. Robson (2003: 278) notes that the unstructured interview is “not an easy option for the novice.”

Whilst remaining within a loosely defined structure, the semi-structured interview permitted participants to express themselves with some degree of freedom. This required questions that encouraged participants to provide complex answers, but it still allowed participants a greater degree of latitude in dictating the conversation according to their own agendas, rather than that of the researcher. However, the greater freedom for participants and researcher both to explore unanticipated areas of interest also increased the danger that the discussion might stray beyond the scope of the research questions. Some participants, too, were unsure of the “conversational” approach, preferring to offer “survey-style” answers.

In practice, it was usually found that the subject matter was of sufficient interest to keep participants from both occupational groups clearly focused most of the time. Excursions into tangential areas of mutual interest advanced the aims of the interview by establishing a deeper sense of rapport with participants, encouraging a less guarded flow of information. In the course of the fieldwork, there was a decreased reliance upon the semi-structured *aide memoire*. Roughly the same topics were covered, but there was a less structured exchange of information. A looser adherence to the semi-structured format appeared to encourage greater comfort in participants, leading to richer data.

3.14 Pilot Interviews

Two sets of pilot interviews were conducted. In the first pilot, three teachers from an international private school (not in the current study) were interviewed very early in the research process. These interviews influenced the literature review.

The second round of pilot interviews included two teachers and two IT workers from international private schools not included in the main study. There were four key objectives in this second round of pilot interviews: First, the development and validation of the mechanical techniques for interviewing; second, confirmation of the importance of the three main concepts: professional status, occupational prestige, and occupational culture; third, testing of the ‘dual-snowball’ sampling technique; and fourth, a test of the semi-structured interview format and the interviewer’s ability to elicit usable information.

The pilot interviews, however, were flawed insofar as participants were very happy to offer “snowball” names. During actual data collection, participants showed far greater reticence to mention their colleagues. The reasons for this are covered in detail in Chapter 4.

3.15 The Interview Schedules

Teachers and IT workers had parallel but slightly different interview schedules. These schedules were not strictly-prescribed lists of questions to be answered in a structured interview format, but rather aides-memoire used to shape and guide the interview.

Early interviews used the following interview aide memoire.

| Teachers | IT Workers | Notes |
|---|--|---|
| Formalities <ul style="list-style-type: none"> • permission to record. "We can still have a conversation without the recorder, but the recorder will ensure that I get it right." • questions? • release form | | |
| Pre-Occupational Profile <ul style="list-style-type: none"> • Parental occupation(s)? • Perceptions of own occupation while still in school? • Perceptions of other occupation while still in school? | | Lead-in. Establish comfort, begin reflection. The questions are less important than the effect. |
| Entry into the Occupation <ul style="list-style-type: none"> • Degree? Where? • Any IT courses? Any education courses? • Post-degree training? Certifications? Hours? Difficulty? | | Context for later comments. Influences the degree to which this participant's perceptions can be generalised? |
| Entry into the School <ul style="list-style-type: none"> • first overseas posting? Where else? • typical IPS? • different from teaching in home country? | Entry into the School <ul style="list-style-type: none"> • How did you get this job? • Have you worked in business/industry? What's that like? Comparison with IPS? • Is this a typical IPS? | Move the discussion to the present; continue with setting the contextual foundation. |
| Professional Status <ul style="list-style-type: none"> • Do you see yourself as a professional? • What does it mean to be a professional? • Do you think people see you as a professional? • Do you think (others) see you as a professional? • Do you see (others) as professionals? • Who's more professional? | | Specific Research Question #1 |

| Teachers | IT Workers | Notes |
|--|------------|--|
| Occupational Prestige “Prestige” is a way to describe how people in society perceive the value of what you do. <ul style="list-style-type: none"> • How prestigious is your job? (school,Singapore¹,globally) • Do you have more prestige than (others)? justified? • ITW²: more prestige doing IT work at another school or for a bank or a university or a TV studio or ? • ITW²: Does your opinion of the teachers have anything to do with this school? Would they have more or less prestige anywhere else? • TFac²: Does your occ prestige have anything to do with where you teach? Government school? Reservation school? Inner-city school? • TFac²: Does your opinion of IT occupational prestige have anything to do with the fact that they're working here instead of at a university or bank or anywhere else? | | Specific Research Question #2 1: Although national cultures were not a focus of this re-search, this qualifier enabled the detection of national cultures as a factor. 2: Although the questions were different for IT workers and teachers, the common theme was that of work venue as a mediating factor of occupational prestige. |
| Occupational Culture <ul style="list-style-type: none"> • Before you became a (Teacher / IT worker), what image did you have of your occupation? How accurate was that? • Is there any truth to the stereotypes about your occupation? • Does your occupation have a culture? • stereotypes about the other occupation? justified by what you see at school? • Do you think your occupational culture is different from that of (others)? | | Specific Research Question #3 |

| Teachers | IT Workers | Notes |
|--|--|---|
| The Relationship <ul style="list-style-type: none"> • Tell me about your relationships with IT workers. • Do you ever socialise with co-workers? Teachers? IT workers? • In general, how do you feel about technology in schools? • How do you feel about technology HERE? • How does your technology environment affect you as a teacher? • How do you get along with IT workers? Who are they? Why? • How do you see IT workers – more like you, or more like secretaries? • How do your colleagues get along with IT workers? • Do you think you give IT workers the respect they deserve? How do you show it? • Do IT workers give you the respect you deserve? How can you tell? • Do you know the names of the IT workers? | The Relationship <ul style="list-style-type: none"> • Tell me about your relationships with teachers. • Do you ever socialise with co-workers? Teachers? IT workers? • How do you feel about teachers in general? How do you feel about teachers HERE? • How do you get along with teachers? Who are they? Why? • Do you think you get teachers the respect they deserve? How do you show it? • Do teachers give you the respect that you deserve? How can you tell? • How do your colleagues get along with teachers? • Do you know the names of the teachers? | <p>Only the first question was essential in this area; other questions were included as probes.</p> <p>Having broached the three specific research themes, the researcher invited participants to describe the relationships in their own terms. In general, few probes had to be offered; by the time the conversation had reached this section, participants had “warmed to the topic”.</p> <p>The sampling snowball was developed here: starting with relationships in general, participants were moved toward specifics.</p> <p>In some cases, the snowball probe sought information on the the <i>other</i> occupation as well as members of the participant’s occupation.</p> |
| Wind Down, Wrap Up, the Hand on the Door <ul style="list-style-type: none"> • is relationship with (others) typical of others at this school? • other people I should talk to? • Turn off recorder. Thanks. • Did we cover it all? Anything to add? | | <p>If the snowball wasn’t developed in the previous phase of the interview, it was explicitly addressed here.</p> |

With successive interviews, the focus of the interviews shifted to reflect the emerging theoretical interests prompted by participants. Follow-up interviews were less structured, with emphases contingent upon the issues raised by participants and the researcher’s need for clarification or amplification of specific areas of interest.

To encourage participants to offer detailed and honest accounts of their perceptions, the researcher cultivated two subtly different identities at each research site: one for each group of participants. In so doing, the researcher consciously implemented Blumer’s symbolic interactionism (1969) and Goffman’s “presentation of self” (1959). This

construction of identity was based on pre-interview visits to the schools and included clothing, topics of small-talk, and the revelation of details from the researcher's past.

Interviews were carried out in a variety of locations. Some interviews were conducted off-site. In all cases, the participant dictated the location, with the intention that they should feel as comfortable as possible to express themselves frankly.

During interviews, there was a constant tension between personal engagement and formal detachment. Did the researcher's challenge serve to amplify, clarify, or modify the participant's position on an issue? Although clarification might be the goal, there was always the risk that a participant might react otherwise. The use of member checking was essential in mitigating the risk of this distortion: participants were sent transcripts with an invitation to amplify, clarify, amend, or even add new observations.

The nature of the dyadic snowball sampling technique (see Figure 3.6) meant that the above interview schedule was most closely followed with the first participant in a snowball; subsequent participants were asked questions addressing issues raised by the previous participants who had nominated them as cases of interest.

3.16 Analysis

In contrast with quantitative methodologies which separate data collection and analysis (Gall, Borg, & Gall 2003; Cohen & Manion 1994), the naturalist approach interweaves successive acts of data collection with analysis that influences subsequent collection activities. This is congruent with the "dual-snowball" method of theoretical sampling, and it extends as well to the interview schedules for first and second interviews. Aspects of relationships mentioned by a participant were pursued with the counterpart – albeit within limits of confidentiality and discretion.

Defining and Identifying Data: Formal data – that which was subjected to transcription, coding, member checking, and audit trails – was limited to clearly-defined interviews, except in the case of one participant who declined to be interviewed. These interviews were transcribed in full, and each transcript was coded at least once. In some cases, non-verbal cues such as body position, gestures, and pauses were transcribed along with the words uttered by participants. Ad-hoc observations occasionally served as 'conversation points' during interviews. These observations included any notable aspects of relationships between participants in situ.

Mechanics of Collecting and Storing Data: All participants except one agreed to be recorded. Recordings were made using a handheld digital recorder. Computer-based recording was conducted during pilots, but this was later replaced by the handheld recorder, which was smaller and less obtrusive in the context of interviews. Short handwritten notes jotted upon the interview schedule itself were used as reminders of key concepts and significant statements.

As soon as possible, audio files were transferred to a local backup system as well as an online data storage system. The primary research machine had some problems during the project, but backups were reliable.

During transcription of interviews, allowance was made for non-native speakers of English. Where meaning was not materially affected, grammatical errors were corrected, provided that the overall structure and sense of the sentence could be left unchanged. Voice-recognition software was tested, but found to be unsuitable for three reasons. First, the software had difficulty filtering out background noise. Achieving a suitable signal:noise ratio would have required the use of lavalier mics and/or constrained the range of available locations, both of which would have had an unacceptable effect on the tenor of the interview. Second, voice-recognition software was not able to transcribe parts of the interviews where the researcher and participant inadvertently spoke at the same time. And finally, the software had difficulty with two different accents.

A further, non-technical reason to avoid voice-recognition software was that the act of transcription forced the researcher to engage more intimately with the collected data. Non-textual cues such as pauses and intonation lent additional meaning to the raw transcriptions, sometimes buttressed further by the interviewer's recollection of body language during the interview.

Data Reduction and Sampling: The ebb and flow of semi-structured interviews – with brief forays into non-essential areas of mutual interest – was instrumental in eliciting meaningful information from participants. A further motivation for the use of a 'loose' interview structure was the ability to move ad hoc in directions influenced by research participants. Thus semi-structured interviews, as conducted in this study, allowed participants to feel the trust, curiosity, and "naturalness" described by Cohen & Manion (1995) as key components of the ethnographic process.

However, such interviews yielded nearly a quarter million words, including large amounts of material which, though "deep" and "rich" (Watling 2003), was not uni-

formly dense in terms of content relevant to the study. The literature review – carried out largely before the start of data collection – led to a nascent understanding of the issues that might arise during interviews. As a result, interviews were initially ‘sampled’ and analysed in one step. The emergence of unexpected patterns of meaning in later interviews and across multiple interviews resulted in the re-inspection and re-sampling of early interviews.

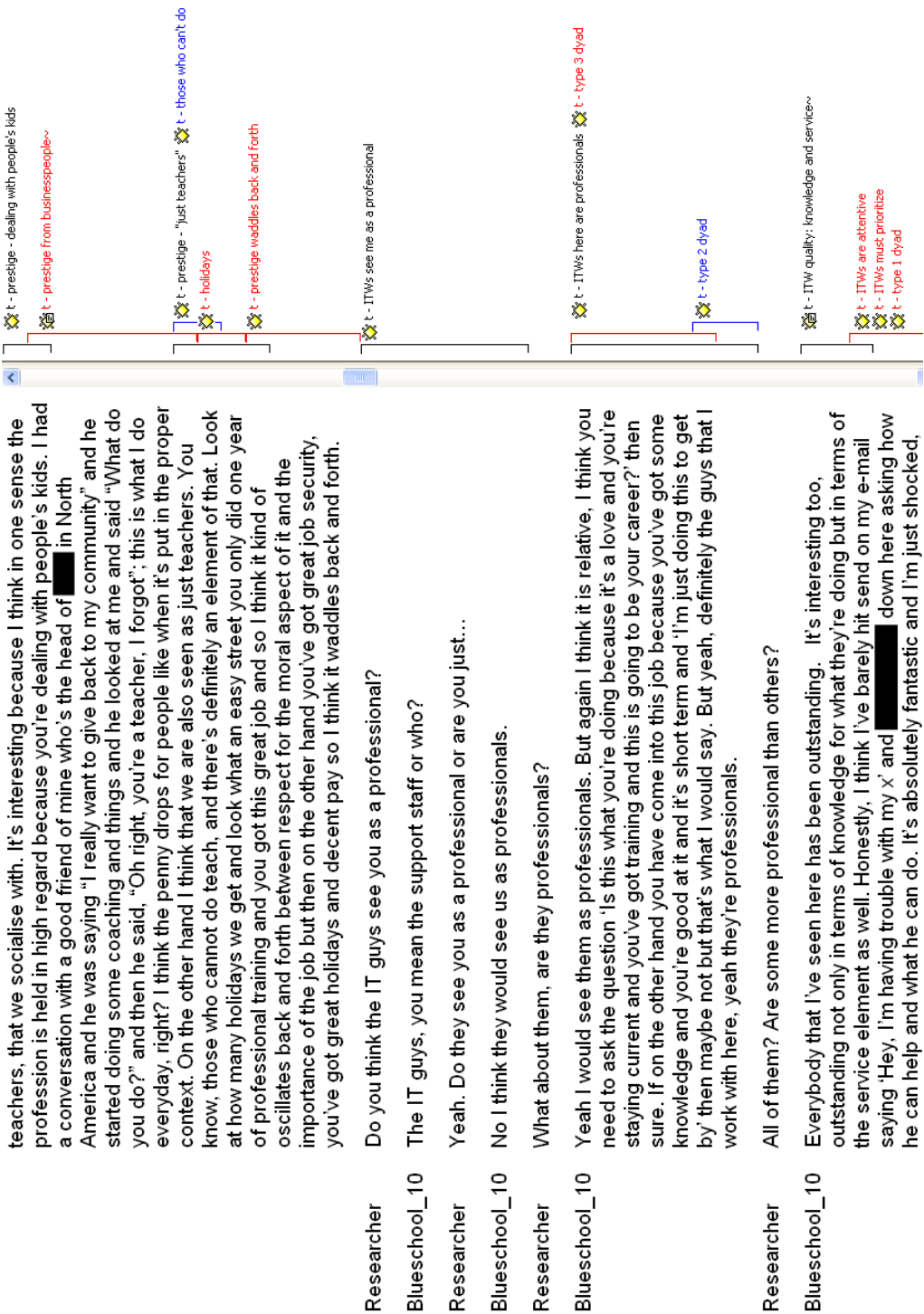
Structuring and Coding Data: Strauss notes that the “making constant comparisons and the use of a coding paradigm, to ensure conceptual development and density” (1994: 5) is fundamental to grounded theory approaches to qualitative data. This was manifested in the present study in part by matters of sequence: at least a first pass of coding and/or memoing occurred after each interview, often prior to subsequent interviews. This encouraged the perception of each participant as a distinct source of insight, rather than part of an aggregate. Subsequent interviews led to a second or third pass of coding and memoing previously-analysed interviews as new patterns and themes emerged.

Flick (1998: 42) observes that “grounded theory research mainly includes the following aspects: theoretical sampling, theoretical coding, and writing the theory.” In this study, theoretical coding began with “open coding” (Strauss & Corbin 1990), where transcripts were searched for notable phenomena such as individual words, phrases, sentiments, and patterns of such communications. As Strauss & Corbin (1994: 274) observe,

Certain other general procedures have made this methodology (grounded theory) effective and influential. Besides the constant making of comparisons, these include the systematic asking of generative and concept-relating questions, theoretical sampling, systematic coding procedures, suggested guidelines for attaining conceptual (not merely descriptive) “density”, variation, and conceptual integration.

The open coding process, then, was devoted to the observation and creation of initial categories of views and behaviours. Extensive memos were made; many were directly attached to codes. Figure 3.8 shows an example of a densely-coded passage of an interview transcript.

Figure 3.8: Coding sample – Teacher Steve



Coding became progressively more difficult with each interview because each observed instance of behaviour was compared with existing codes to determine whether it was a new phenomenon, a variation of an existing phenomenon, or a behaviour that had already been coded.

During the open coding stage, the emphasis was on the accurate observation of phenomena. Therefore, codes were descriptive rather than short, and few attempts were made to reduce the number of codes through merger or conceptual aggregation. Similar codes were retained, and merged only when they genuinely illustrated – through a second or third examination of multiple transcripts – identical phenomena. This merging process sometimes resulted in the re-coding of transcripts, as emerging insights cast a new light upon previously-coded material.

During the axial phase, the emphasis was on the generation of “parent codes” around which groups of similarly-themed codes could be arranged. This clustering approach roughly followed along the lines of the specific research questions. The main themes covered by the questions are represented by large numbers of codes. Successive ‘branching’ was effected through the creation of axial sub-codes. For example, “socialising” became a branch of ‘relationships’.

However, branches emerged that were not within the bounds of the research questions. These deviations were not unexpected nor unwelcome: they highlight the value of the research method insofar as it captures the reality of the participants rather than the prefabricated conception of the researcher. In a sense, perhaps, the researcher provided the *etic* core, while the participants’ *emic* made up the branches and leaves.

The dyadic nature of the research affected coding. Initial codes were assigned prefixes of “t” for teachers or “it” for IT workers; when a code for one group could clearly also be used for another group, it was modified to show applicability to both occupational groups. Most themes were graphically mapped with a left-right or top-bottom division between the two occupational groups. During the analysis, however, axial coding became easier as congruent or divergent perceptions between occupational groups were easier to discover.

Figure 3.9: Axial coding (mid stage)

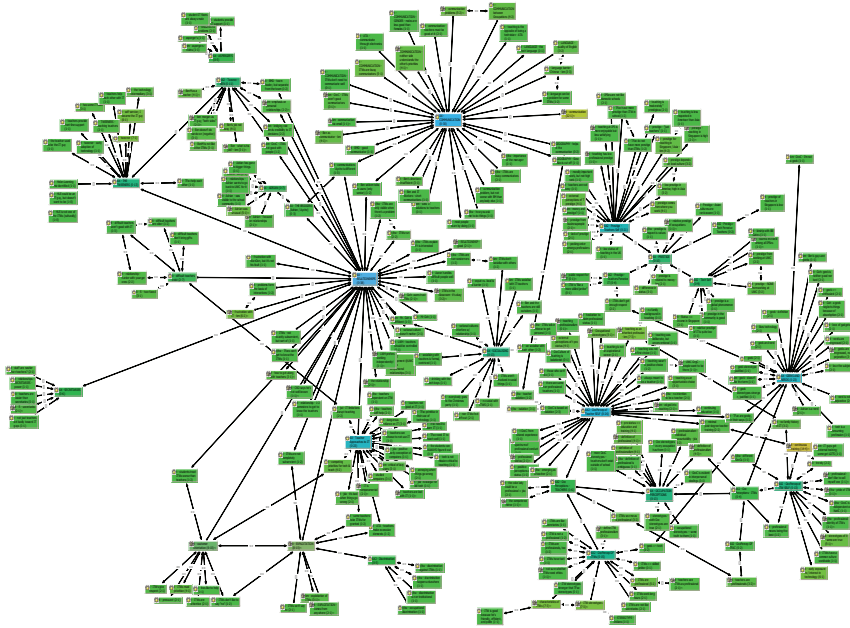
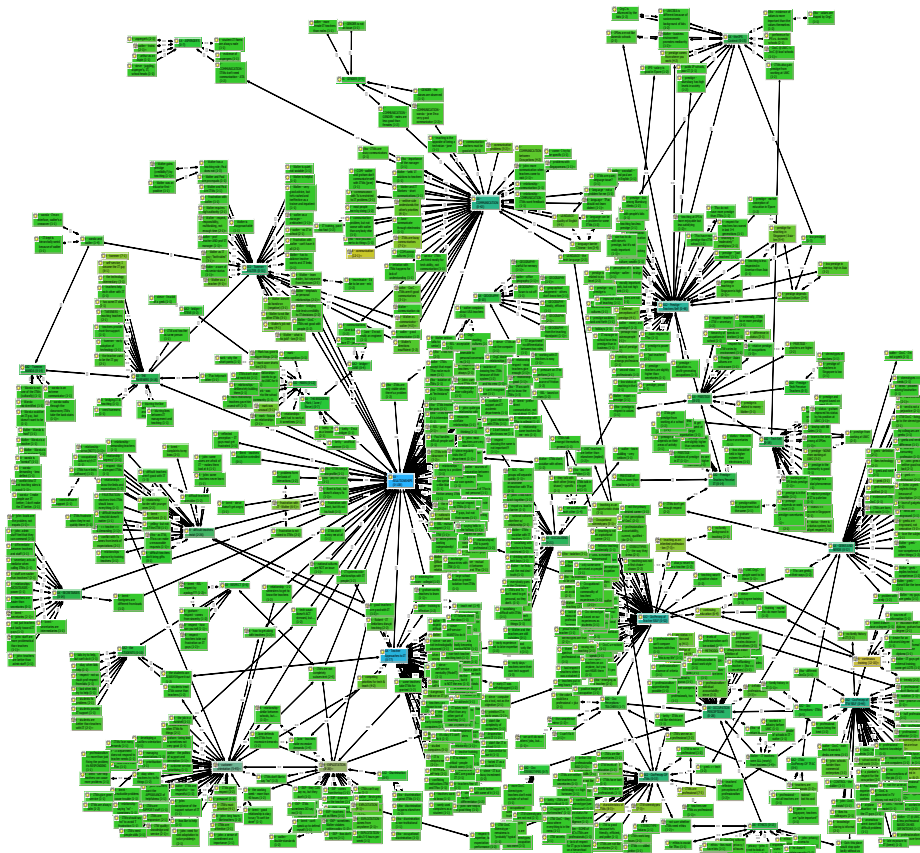


Figure 3.10: Axial coding (late stage)



3.17 Researcher Positioning

Consistent with findings of Huntley & Davis (1983), my interests and values at the end of my secondary education carried through three tertiary degrees and the first two decades of my career. Degrees in English & German, Journalism, and Education were balanced by extensive courses in computer programming and music engineering. Professional development in teaching occurred in parallel with IT industry certifications in operating systems and computer networks. Out of a nineteen-year career at the time of this research, thirteen were spent teaching internationally; two were spent at a school in northern Canada, and two were spent working in the entertainment/technology industry overseas.

Blumer's (1969) first principle of symbolic interactionism is that individuals act toward things based on the meanings that they impart to those things. As a participant in both occupations, I was able to understand the meanings that both occupational groups brought to their experiences. My dual identity gave me theoretical and practical access to both worlds.

The risk, however, was that of projecting myself into the research to the exclusion of participants or introducing my own preconceptions into their relationships. In this respect, it was helpful that IT workers represented national cultures other than my own: the temptation to project my own culture upon them was curtailed by the difference in nationalities. By contrast, because I shared a "western" cultural background with most teachers, I was particularly careful to avoid projection with that occupational group.

My identity with teachers was nearly automatically assumed by participants: in my contact email to teachers, I mentioned that I was working as a relief teacher – several participants had worked with me in that capacity. For IT workers, the identity was more difficult to establish, requiring me to seed the early parts of interviews with technical observations and anecdotes. In response, Tech Graham remarked, "You have been there, brother. You have been there." and Tech Eric said, "So you're a technical guy!"

3.18 Trustworthiness

In a coherent research design, the quality of research, evaluative criteria, and even nomenclature of quality are contingent upon other aspects of the research design. The concepts of "proof" and even "probability of generalisation" imply the closed fist of

quantitative logic: a hypothesis is considered 'true' under certain circumstances if it can be shown to apply to a certain arbitrarily-assigned number of cases.

By dint of its qualitative nature and its focus on *perceptions of social realities*, incontrovertible facts cannot be gleaned from this study. Just as "...the design of each case study is specific to the phenomenon being studied and the research conducting the study", (Gall, Borg, & Gall 2002: 441), so too do specific aspects of trustworthiness vary according to the context of a qualitative study. Nonetheless, there is still a need to stake a claim of quality against which the work may be measured.

Trustworthiness was an intrinsic aspect of the research design in this study, not as a goal but rather as a quality to be articulated throughout the project. At the same time, the coherence of the design itself can be regarded as a form of trustworthiness, according to Altheide & Johnson (in Robson 2002).

Beyond coherence in research design, Lincoln & Guba's (1985) four parameters of quality will be adopted as guides, since they provide excellent congruence with other facets of the study. Credibility, confirmability, dependability, and transferability will determine the degree to which this study's findings can be trusted.

Member Checking: In cases where recording was permitted, research participants were given a transcript following their interviews. Although analysis of the interview began prior to participant sign-off, analyses were not finalised until such time as participants had either confirmed the veracity of the transcription or, in some cases, had failed to register dissatisfaction within a reasonable time. The words that were analysed, therefore, were both credible and confirmable.

Audit Trails: Dependability and confirmability are primarily conferred through the use of audit trails (Joniak 2005: 10), provided to examiners and available with approved written request.

Triangulation: Key (2005: 5) observes that credibility, dependability, and confirmability share triangulation as a means. Triangulation of space (Cohen & Manion 1994: 236) was achieved by viewing multiple relationships within a school.

As noted earlier in this chapter, relationships described by participants fell into four categories. For purposes of triangulation only two were of note:

- I. 1 teacher — 1 or more named IT workers
- III. 1 IT worker — 1 or more named teachers

Relationships of types I and III were of particular interest since they lent themselves to a dyadic analysis, providing a further form of spatial triangulation. This triangulation focused on the ability for multiple participants to discuss their respective views of a single relationship.

Another form of triangulation lay in the dynamics of the interview itself. Questions were re-asked or re-phrased at different stages of an interview to seek consistency in the participant's answer. Some probes were used not to elicit new information unknown to the researcher, but rather to gauge the consistency of the participant's account.

Transferability: Because this study was the first of its kind, the objective was not to establish a broad 'typical' profile of relationships between teachers and IT workers, but rather to seek a range of relationships that might exist. Collinson's work on research administrators (2006) is only superficially similar.

Gall, Borg, & Gall (2003: 465) note "A research study's findings are generalizable to the extent that they can be applied to individuals or situations other than those in which the findings were obtained." Given the limited number of participants, therefore, it is possible that intermediary and extreme values might be missing. Although some range of relationship perceptions was discovered, generalisation is limited to the possibility that other schools might feature relationships between teachers and IT workers that manifest roughly similar parameters, ranges, and patterns. However, even that level of transferability is constrained. The researcher cannot clearly demarcate the boundaries *outside* of which the study defies transferability. Without a follow-up study – preferably on another continent – we cannot begin to know what it is that we do not know.

3.19 Ethical Issues

This investigation into relationships was relatively simple and non-intrusive from an ethical standpoint. Gatekeepers at four Singaporean international private schools (those listed in Table 3.1) were unanimous in their assessment that the research topic itself was not deeply contentious.

However, there were three areas of potential difficulty, mandating a review of ethics codes and preemptive consideration. First, because teachers and IT workers typically hail from different cultures – a trend noted in Cambridge (2001) and confirmed in this study – both groups may have been reticent to express negative feelings for fear of having been regarded by managers as culturally intolerant.

A second issue was that, in organisations with passive/defensive cultures, (Cooke & Szumal 1993), negative sentiments may have been perceived as dissent. Participants expressing unhappiness could harbour fears of managers purging dissenting voices.

These first two concerns had an impact upon trustworthiness, but they also affected the ethical position insofar as the participants' concerns might have been well-founded. It could not be ruled out that school leadership might take umbrage at a participant's views. Consistent with the University of Leicester's (2006) fifth basic principle of research ethics...

Researchers have an obligation to protect research participants wherever possible from significant harm consequent upon the research.

...anonymisation protocols were strictly enforced. After permission for research had been obtained from gatekeepers at Bluesburg, there was no further communication regarding the research. The 'dual snowball' sometimes led participants to ask why they had been chosen and who else had been interviewed. These questions were answered as honestly as possible without revealing or hinting at the identities of other participants.

The third ethical issue was potentially more serious, as it involved sections 3c and 3b of the Leicester code of research ethics. The nature of digital communications leaves most computer-based activity vulnerable to surreptitious and untraceable eavesdropping, particularly by IT workers. Two anecdotes from the researcher's own experience may illustrate the risks involved.

Some years ago, the researcher was asked to configure a headmaster's email account. A meeting drew the headmaster away and the researcher had to complete the task using the headmaster's username and password. Four years later, the headmaster had been promoted to a senior position and the researcher had moved on to a different country. However, in preparing for this study, the researcher tested the former headmaster's account and discovered that neither the username nor the password had changed.²

The significance with respect to ethics is that IT workers could give similar accounts in discussing their relationships with teachers. This type of behavior is not entirely unusual, comprising a kind of "white hat" penetration test (Geer & Harthorne 2002, Willbanks 2008). However, such an act – even if it does not result in damage to the victim and even if it is unsuccessful – is still a crime under Singapore's "Computer

2 This was not a premeditated act involving the writing down of the password. Instead, the researcher was able to recall this information, having an unusual ability to remember certain data and sometimes having difficulty "unremembering" it.

Misuse Act” (Singapore AGC 2007). Prior to the onset of research, it was decided that the concept of “imminent harm” should apply:

1. This information was not actively sought in the interview schedules.
2. Where participants merely recounted an experience from the past, it was deemed that the past event could no longer be influenced.
3. Where a participant might choose to demonstrate such activity to the researcher, it would be discouraged for the reason that it would place the researcher into a conflict situation.
4. Where a participant might proceed with such activity in spite of the researcher’s objections, the researcher would leave the room.

A second incident occurred when the researcher was asked to help a teacher recover files from a hard drive. In the process of recovering these files, the researcher discovered a large number of images not suitable for students. As with the first situation described, the researcher’s concern in the current study was not a direct encounter with unsuitable content, but rather the possibility that an IT worker might report having seen such images on a specific teacher’s computer. Again, the policy adopted by the researcher – in advance of fieldwork – was based on the idea of imminent harm, in this situation made more cautious due to the complication of young people in the school environment.

The researcher adopted the following guidelines to cover the contingency where a research participant might reveal “insider information” regarding inappropriate content on computers at school:

1. This information was not actively sought in the interview schedules.
2. Where a report of inappropriate material arose, participants were asked whether they felt that a threat to students existed.
 - a. If no: participants were asked how their knowledge of this information affected their respective relationships.
 - b. If yes: participants were encouraged to report the matter to appropriate school leadership.
3. Further discussion of the matter was not encouraged by the researcher.

The researcher accepts that these responses to potential ethical problems might be both pragmatic and morally evasive. However, this ethical stance was regarded as a reasonable compromise, meeting the requirements of the Leicester Code of Ethics while allowing the completion of the research without treading too deeply into a quagmire of irreconcilable imperatives.

3.20 Involvement with the Research Venue

Eight months prior to the start of data collection and analysis, I began working at Bluesburg as a relief (substitute) teacher. This was done purely for personal economic reasons. However, it had a beneficial impact upon the research process.

Because of my relief teaching work, it was relatively easy to engage participants. My familiarity with the school imparted a deepening understanding of the organisational culture: there seemed to be a distinct tone used in emails, and copying this tone may have developed a sense of trust in candidate participants. Following an extended relief-teaching assignment of several weeks, participants would have seen me on campus in a non-research context, so my presence was less obtrusive. Students came to know me and greet me, further increasing my ‘insider’ status.

I was also able to develop an unexpected level of intimacy. With knowledge gained from frequent visits to the school and more than 150 hours on-site, I was able to make questions more meaningful by relating them to the immediate school context. When discussing professional status, for example, I made reference to one of the cafeteria employees who was profoundly capable at calculating the cost of items in the customer’s hand and assembling change. Several participants had also noticed this feat, and it became a brief focal point. I invited participants to tell me whether that employee was or was not a professional. Where early participants struggled with abstractions, later participants were able to use the concrete situation to resolve their positions more clearly.

Combined with the “outsider’s freedom” to approach anybody and ask any question, this “organisational intimacy” made it easier to gain access to individual participants and their thoughts, and it permitted me to shape interviews and understand responses in a manner consistent with the organisational culture.

Among teachers, participants came from a wide range of functional and geographic areas. Interviewing often occurred at one of the school coffee shops (at participants’ requests), but this was a ‘neutral’ location: it was not the teacher’s own office or classroom. By contrast, I conducted several interviews in the IT Office area, where the teachers and technicians saw me more frequently. I quickly ceased to be an oddity in either area. By the end of the year during which I collected data, I had served as a relief teacher for every faculty member in the IT office. Although my technology credentials also brought me closer to the IT workers, the national boundary remained and I was treated as a ‘privileged outsider’ rather than a genuine colleague of the IT workers.

“There were quite a lot of single men who didn’t have girlfriends, didn’t wash a lot. Quite odd. Quite odd habits, that way.”

Teacher Marcia, commenting on a work assignment in France

Chapter 4. Findings 1 – Professional Status, Prestige, and Occupational Cultures

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4.1 Introduction

This study set out to investigate how teaching faculty and IT workers at an international private school in Singapore perceived their reciprocal relationships. Through a detailed analysis of interview transcripts, open codes were generated and subsequently revised and refined into axial groups.

Although the literature was helpful in seeding codes and categories, some pre-fieldwork codes were never used. Some axial categories were marginally represented in the literature; others had no antecedent in prior research. Therefore, some sections of the following findings extend far beyond the boundaries of the three specific research questions.

The findings in this chapter address the first two specific research questions as well as the “occupational culture” aspect of the third research question. These questions were:

1. How do teachers and IT workers regard their own professional status and that of their counterparts?
2. In the views of participants, what is the respective prestige of IT and teacher occupations?
3. How do participants perceive relationships and occupational cultures of teachers and IT workers?

These findings present approximately parallel views of teachers and IT workers. Therefore, both sides are presented in turn, with a summary following each section. Further findings are presented in the following chapter.

4.2 Names and Quotations

All names of research participants are aliases. Gender has been preserved only when theoretically meaningful. In contexts where occupational function is not clear from context, the participant's occupation has been prepended to the name, e.g. "Teacher Greg", "Tech John".

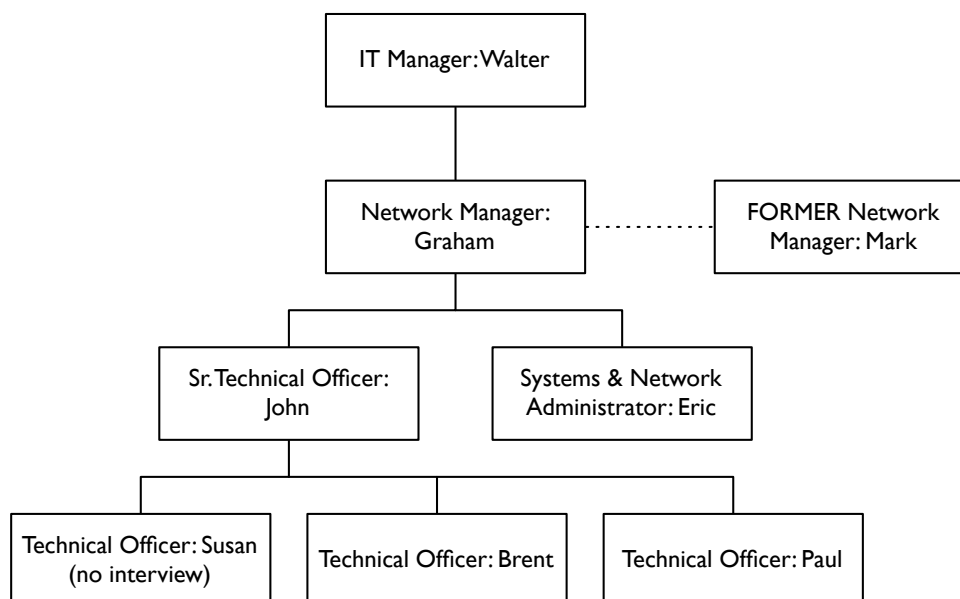
Quotations from participants are contiguous speech except where indicated by ellipses, which may indicate omitted material spoken by either the participant or the researcher. Some grammatical errors have been corrected to improve clarity.

Table 4.1: Research participants

| Teachers | | IT Manager | IT Workers |
|----------|--------------|------------|-------------|
| Greg | Bill | Walter | Paul |
| Shawn | Steve | | John |
| Marcia | Jane | | Brent |
| Alice | Wanda | | Eric |
| Robert | Howard | | Graham |
| Sally | Betty | | Mark |

Steve was principal of one of the school sections; Wanda was the head of the Computing Department – as opposed to the IT support group. Mark was a former IT worker at Bluesburg. However, his name frequently arose in conversations, so his participation was vigorously sought.

Figure 4.1: IT Support structure at Bluesburg

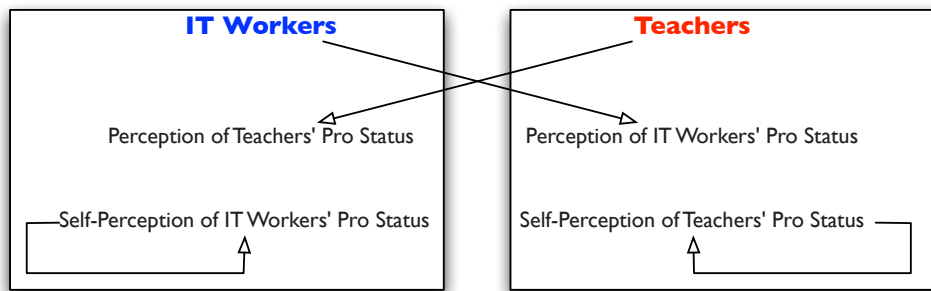


4.3 Perceptions of Professional Status

Professional status was introduced into the conversation without reference to other occupational groups. The notion of relative levels of professional status only emerged with some participants, after they had expressed clear ideas about professional status.

Asked whether they were “professionals”, participants in both occupational groups offered the widest range of responses, ranging from an unqualified “no” to an unqualified “yes”. In general, IT workers were reluctant to don the professional mantle, while more teachers were willing to do so. Members of both occupations were more likely to talk about themselves than the other occupational group. Consistent with the symbolic interactionist framework, perceptions of these groups can be visualised as follows:

Figure 4.2: Perceptions of professional status



4.3.1 Teachers' Self Perceptions – Entry into the Occupation

Teachers were asked how they came to be teachers. Although several asserted that they had always held teachers in high regard, *only one teacher* had come into the occupation immediately out of secondary education, and in many cases, it was not a first choice. They studied other subjects in university – or avoided university entirely – until some combination of circumstance and inspiration led them into education.

Marcia studied art history and English literature; Greg studied mathematics; Robert studied fine art. Teachers Steve, Jane, Wanda, and IT Manager Walter all worked in business before entering university. Shawn was a particularly interesting case, since he had been an IT worker in two private schools before becoming a teacher. The emerging pattern was one of teaching as an inadvertent occupation.

Walter: Spent two years doing (business analysis) and decided I actually did want to go to University. ... When I finished at university, I then spent another two years working again...

So I was kind of working for the company but doing research at the same time when I did my first master's degree. During the course of that I decided actually teaching might be quite fun. (Laughs) There was no life plan at all, as you can see.

Steve: What I loved was my time teaching at Outward Bound and my time that I was doing coaching. So we made a decision that I would quit my job, which was unbelievably lucrative, and I went to teacher's college. ... So I came to it somewhat later in life but intentionally.

Sally chose teaching by default, rather than outright interest:

(I was) trying to figure out what else I could do. I thought there wasn't a lot of other choices that I figured would work for me. And English was something that I knew I would do well with, and I liked kids.

Howard's tale was similar:

When I was a student I was very interested in languages, so that was what I wanted to do, learn languages, and then after learning languages why not be a teacher? You've got lots of holidays.

An exception to the pattern was Bill, who loved school as a student: "(I intended to be a teacher) from day dot. I changed my subject regularly, but teaching was there."

4.3.2 Teachers' Perceptions of Their Own Professional Status

In chapter 2, the argument was advanced that professional identity might influence relationships. The first aspect of this was teachers' conceptions of themselves as professionals.

Greg was a relatively young teacher. Asked whether he was a professional, he paused briefly before he replied "I very much like to think so, yes."

Marcia also paused prior to answering, "Yeah, I do."

Jane did not pause, but also stopped short of an unequivocal response: "Yes. I think so."

Betty and Steve both signalled immediate agreement to the question. Wanda was also quick to assert professional status:

Researcher: You're a professional?
Wanda: I hope so.
Researcher: A professional what?
Wanda: Teacher. Absolutely no question about that. I'm a teacher.
Researcher: Were you ever a professional IT person?
Wanda: Yeah.

As an administrator, Steve was particularly concerned with conceptions of professional identity and professionalism. He pointed out that his own professionalism was based upon a level of commitment, membership in professional organisations, and accountability to objective standards – parameters that might specifically exclude some teachers in certain situations:

When you've got people who are not qualified teachers going into Korea teaching English (saying), "I need to make some money. I just need to take a year out, I want to do some travelling." Are they teachers? Sure, they're teaching English. Are they professionals? No. ... And I think we've definitely got things skewed because we can't find a common currency that we can deal with in teaching.

4.3.3 Teachers' Perceptions of External Professional Status

In addition to teachers' perceptions of themselves as professionals, teachers were asked whether other members of the organisation and their respective societies could be expected to acknowledge their professional status.

Greg felt that the professional status of teaching had improved in the United Kingdom:

... it's been improving in that respect. The whole concept of teaching as a profession... the attitude towards it has been improving. ... I think people are responding to that and recognising that it's an important profession and there needs to be people to do it.

Robert observed cultural differences. Asked whether others saw him as a professional or clerical, he replied:

Here, professional. In (the home country), perhaps clerical as well. We were in a small town and we made more money than the average, so,

“ooh”, but it was like, “Oh, yeah, you’re a teacher. Why didn’t you do something more professional – more Mercedes Benz-ish?”

Sally was asked whether the ‘traditional’ professions could be expected to acknowledge the professional status of teachers: “Probably. I would think yes, but to a lesser degree.”

4.3.4 Teachers’ Perceptions of IT Workers’ Professional Status

Teachers’ perceptions of the professional status of IT workers varied widely, with little apparent pattern or correlation with the teachers’ own technological skill.

Marcia: “They’re in a supporting capacity. So probably a similar status to, ah, secretarial staff.”

Greg had had some training in technology during his university degree, so he had some inside knowledge of the occupation. Early in the interview, he asserted that IT workers were professionals. However, he later said –

(Paul) is more someone who will just come into a classroom and look at a projector and try to fix it... he’s almost like a more skilled janitor, really. He’s someone that can... work and fix some of the facilities at the school, but he’s just working slightly more high-tech gadgets.

By contrast, Betty – who was an accomplished, self-taught user of technology, viewed IT workers as having a high professional status:

...those IT technicians who work in this school, they’re mission critical. If the network goes down, we’re stuffed. ... we’ll close the school. We’ll shut it down until it’s running.

Alice had minimal interaction with her assigned IT worker, but saw him as being different from a secretary:

No, I think he’s a professional. He knows what he’s doing. I don’t know. I don’t think of him as beneath me or anything. ... As long as they’re passionate about what they do. If they’re good at what they’re doing, I think then they’re professional.

A few moments earlier, Alice had asserted that street sweepers could be professional, too: “Why can’t they be professionals? If you like what you’re doing and you feel passionate about it and you do your best with it and you do a good job at what you’re doing, I think you’re a professional.”

Sally recognised the existence of different levels of professional status, placing IT workers “...more of a secretary level, which would be slightly below a teacher.”

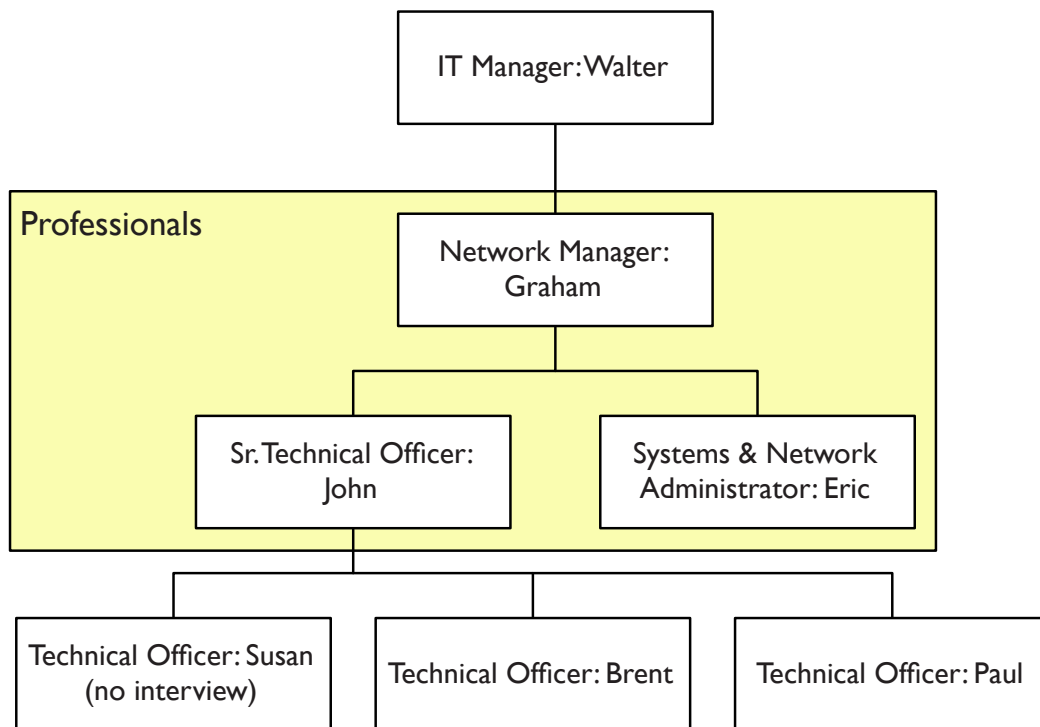
Steve saw professionalism as a relative quality, depending on the individual’s approach to the tasks at hand:

Yeah, I would see them as professionals. But again... I think you need to ask the question ‘Is this what you’re doing because it’s a love and you’re staying current and you’ve got training and this is going to be your career?’ Then sure.

Bill was asked whether IT workers were more like teachers or secretaries: “Neither. They’re just in their own right. They’re the IT guys.” Bill further noted that his colleagues might experience frustration *until they had built a relationship* with their assigned IT worker. Bill noted the difference between semantic and characteristic definitions of the term: “Do I think they’re professional Yes. Do they have an officially recognised profession? I don’t know.”

IT Manager Walter, however, placed some IT workers in the realm of secretaries: “They (have) very little independence in what they do; it’s basically they are reacting to requests or direction. So, very little autonomy.” However, insofar as some of them were able to exercise judgement in their tasks, he added, “I might segment them out. Say that perhaps Graham was. Maybe I’d pull Eric up with Graham. These (other) guys I would not... they do their job very well, but I wouldn’t necessarily call them professionals. John kind of falls in there, sure.” In reference to the organisational chart, then, Walter places the lowest-level IT workers *outside* the professional realm.

Figure 4.3: Walter's perceptions of IT workers' professional status



4.3.5 IT Workers' Self Perceptions – Entry into the Occupation

Unlike several of the teachers, none of the IT workers had a parent involved in technology. John and Mark did not speak of their families, but Graham, Eric, Brent, and Paul all had parents involved in non-academic occupations.

Although Brent had exposure to IT during his polytechnic¹ days, he did not consider it as a career: “Definitely not. I was better in humanities subjects.”

The rest of the IT workers mentioned early interests in IT. Paul enjoyed the subject, and achieved an industry certification while at polytechnic. Graham began doing technical work at the age of 12, fixing his own computer “...and being a wiz kid about it.” Eric was interested in computers during his secondary school days: “I was fascinated by, ‘How do they program such good graphics?’ Stuff like that.” Mark was also interested in computers from his secondary school time: “I started off doing very well in computing when I was in my secondary school.”

¹ In Singapore, “polytechnic” schools are post-secondary institutions, typically with an industry focus, granting 3-year diplomas.

4.3.6 IT Workers' Perceptions of Their Own Professional Status

As a group, IT workers were reluctant to adopt the professional mantle. In part, this appeared to be related to a functional definition of "professional" which emphasised an absolutely mastery that might be impossible to achieve.

Asked about his professional status, Mark answered, "What does that mean? In terms of what? (laugh)"

Researcher So is it impossible for an IT guy to be a professional?

Mark Not really but maybe some of the guys are really good in particular themes then they are particular field professional.

John was similarly uneasy about claiming professional status – both in terms of his perception of society's willingness to grant that title, as well as his own definition of the concept:

Researcher Are you a professional?

John I don't now whether I'm called professional.

Researcher Should you be?

John I'll say, "half professional" because I'm still learning, you see? I'm still learning a lot of new things. You must tend this, but new things still coming in; you still need to master a lot of things.

Brent agreed that professional status could only be claimed under certain conditions:

Researcher Do you see yourself as a professional?

Brent Actually... no. I feel that I've got a lot of things which I don't know how to solve. Some problems, IT doesn't help you solve them. The solution just creates another problem.

Researcher So a professional has mastery over the field?

Brent Yes.

Researcher Is that possible in IT?

Brent I think it's possible, but not for personal support.

By contrast, Eric saw the title in terms of a responsibly to behave in a certain way:

Researcher Are you a professional?

Eric I can consider that.

Researcher What makes you a professional?

Eric The way we need to handle users.

Graham, however, had other reasons to avoid the term. He was reluctant to call himself a professional because it had implications for relationships:

So most of the time I don't like to position myself as a professional then, you know, I'll begin the, "Okay this is my line. No don't come over".

4.3.7 IT Workers' Perceptions of Teachers' Professional Status

Though they were to claim it for themselves, most IT workers were quick to grant professional status to teachers. However, there were two distinct approaches taken by IT workers who answered the question. The first approach is one of specific functional quality, where teachers were granted professional status on the basis of the way they carried out certain tasks. Asked whether teachers were "professionals", John replied, "Well, in their teaching line, they are professional. I would say when they come to their teaching, they are very professional." Mark's response shows a similar approach: "I think they are professional in teaching."

Eric's response reveals that, for him, the professional status of teachers is primarily a matter of formal definition:

| | |
|------------|---|
| Researcher | Are all the teachers professionals? |
| Eric | Teaching is a profession. |
| Researcher | Are all of your colleagues professionals? |
| Eric | I can consider that, yeah. |

Brent was more ambivalent in his appraisal of teacher professional status.

| | |
|------------|--|
| Researcher | Are teachers professionals? |
| Brent | Yes and no. It depends on the teacher. ... Most of the users are good (as professionals). Only 1 or 2 aren't, but I won't give their names. On one day, I couldn't solve a problem... in front of me, he just kicked a chair. After that, I let him cool down and I came on the next day. ² |

For Brent, then, professional status is contingent upon acting in a certain fashion – re-turning to the functional approach adopted by Eric and Mark.

² The Kicked Chair will be discussed in greater detail in the following chapter.

4.3.8 Summary: Perceptions of Professional Status

There is a marked difference between the two occupations and their approaches to the questions of occupational entry and professional status.

Whereas teachers typically regarded education as a “why not?” profession, IT workers were far more likely to embrace technology careers as a matter of personal interest. Brent was the significant outlier in this area, coming to IT only during his post-secondary studies, and even then having a preference for non-technical subjects. Among teachers, Steve’s embracing of teaching after a “lucrative” business career is an uncharacteristically strong embrace of the occupation.

Teachers claimed professional status, but in a qualified fashion, as if not certain that it was unequivocal or entirely deserved. IT workers were even less likely to assert professional status, with several arguing that it was contingent upon a mastery that would be impossible to achieve in a general sense.

The cross-occupational findings agreed with the inter-occupational findings: IT workers acknowledged teachers as professionals, whilst teachers had mixed opinions regarding the professional status of IT workers.

4.4 Perceptions of Occupational Prestige

Whereas professional status helps establish a foundation for occupational identity, relative prestige is a more direct indicator of inter-occupational relationships. A large disparity between occupational prestige and professional status may be a source of tension – both within and between occupational groups. Did the occupational groups feel that they were accorded sufficient prestige – both by the other group and by society in general?

Nearly all participants associated occupational prestige with income. Although early attempts were made to distinguish respect and prestige, those terms became synonymous throughout the interview process.

4.4.1 Occupational Prestige of Teachers

Among teachers at Bluesburg, prestige is a complex and often contradictory phenomenon. There is a recognition that Bluesburg is one of the top schools in Singapore. At the same time, there is a recognition that teaching is an occupation that suffers from

a generally low level of prestige – whilst simultaneously occupying a position of enhanced moral standing. Further complicating perceptions of prestige, expatriate teachers in Singapore are typically paid a salary that allows them to enjoy a high quality of life, even within the context of a notoriously expensive country. Finally, the issue of relative prestige includes not only the IT workers within the school, but also the parents of the students – who are themselves typically expatriates earning salaries much higher than those of the teachers.

4.4.1-1 The School's Prestige

Some teachers felt that they gained prestige from the high level of standing that Bluesburg enjoys among international private schools in Singapore.

Alice: ...obviously, in Singapore, this is one of the top schools... clearly there's a prestige attached to being from this school.

Robert: ... to get hired at this school... everybody is above average.

In terms of her own self-perception, Betty discounted the effect of teaching at a school that itself enjoyed a high level of prestige: "...I prefer to look at the person ... It's not something that concerns me in the least. If I have to choose a new school, prestige does not enter into the question."

4.4.1-2 The National Context

When teachers were asked about their occupational prestige, national context often arose, most commonly insofar as Singaporean/Asian perceptions of prestige might be higher than in Western countries. Howard spoke at length about the contrast:

...there will be a difference in the local school, there will be a difference here, there will be a difference in (European country) , there will be a difference depending on the culture. ... So in Singapore society, I think they value their teachers.

Sally also addressed this divergence:

I think Korean and Japanese parents are extremely respectful... 'Wow, you're teaching my child; that's a huge thing.' I think, in Asia, teachers are quite well revered. ... In America, there's been such a... "teachers get three months off"; "they get paid a lot for not doing a whole lot..."

Bill agreed with this assessment:

In terms of education in Asia, just by that alone, teaching is considered prestigious in a way that is entirely taken for granted in, say, the western world.

By contrast, Betty observed that the conception of education in Singapore had changed from a traditional model to one of mercantile exchange. Paraphrasing what she saw as a typical attitude: "...a teacher is a person who is hired like any other – I pay fees and I expect results. ...I don't care who my kid is, I'm paying the money, so you have to produce results."

Bill also noted this shift in Singapore:

The local system I believe until recently held teachers in great esteem. But now there's a generation of parents with a "I know my rights" kind of attitude and that is changing in Singapore, I believe, whereas the previous generation, the teacher was everything; on a pedestal, so to speak.

These perceptions – by expatriate teachers – of how teachers are viewed in Asia are relevant not because of their possible truth, but rather because they are the teachers' *perceptions* of their prestige.

4.4.1-3 The Clients' Context

Fees for top-tier international private schools in Singapore are higher than €10000 per year, and scholarships are scarce. As a result, schools like Bluesburg cater largely to parents who are wealthy – or whose businesses are willing to underwrite tuition costs.³ Therefore, the comparatively high salaries of teachers wither in comparison – with concomitant effects on relative prestige.

Betty articulated this most clearly:

hWell, our school, because of our socioeconomic background, many parents see us down here (low prestige) whereas we want to see ourselves up here (high prestige). And the reason is, we compare ourselves to teachers and conditions from where we're from and think we're above. Whereas parents who are high-flying, blah blah blah, look at themselves and look at their SUVs and so on, would look at us and think, down there.

³ Exception: children of teaching faculty are typically granted full tuition as an employment benefit.

As a department head, Robert observed that the teachers – perhaps unlike typical parents whose children attend Bluesburg – are not managers or members of the traditional ‘high-profile’ professions:

We’re not the doctors or the lawyers; we’re the guys with our feet on the ground. We’re working with the kids; we’re working with the equipment and people to get things done. We’re not management people – well, I am – but, in general, teachers are not management level. They’re front-line.

Walter mentioned that the prestige enjoyed by teachers in Singapore was largely related to their being expatriates: “I live in Singapore, and that’s where the prestige comes from... as opposed to what you do.”

When asked about teaching prestige, Bill and Sally both paused before answering.

Bill: (slightly longer than a short pause) Well, we’re probably at the bottom of the expat ladder in Singapore, so ‘not very’.

Researcher: In terms of ranking prestige, where do you (as a teacher) fit?

Sally: (medium pause) Lower half.

Jane observed that teachers at Bluesburg had salaries that were substantially better than those enjoyed by teachers in the United Kingdom: “What we’re being paid here is quite good money. (Dressing in a “dull fashion” is) ... not an excuse in Singapore. Maybe in the UK, yes. But not here.”

In general, then, teachers at Bluesburg enjoy an increase in *absolute* prestige through working at a top-tier school, but their *relative* prestige is unchanged because of the higher socioeconomic status – and therefore social prestige – of their clientele.

4.4.2 Occupational Prestige of IT Workers

As with teachers, the perception of occupational prestige among IT workers is a complicated phenomenon, comprising factors that sometimes play against each other – even while they are themselves internally inconsistent. These factors include the implications of working at Bluesburg as well as the overall perception of IT workers in society.

4.4.2-1 Working at Bluesburg

IT workers manifested two strikingly different views regarding the prestige implications of working at an international private school – and specifically Bluesburg – instead of another location. Paul and John felt that they gained prestige from working at Bluesburg, while Eric, Brent, and Mark disagreed.

Researcher: Does that make any difference to people if you see a friend and you say, “Oh, I’m working at Bluesburg.”

Paul: To them, it’s like, “Wow. Working with international schools.” Yeah.

Researcher: If you went to (another international school), would that be as good?

Paul: Should be, I think.

Researcher: What about a government school?

Paul: I still feel that international schools are more impressive.

John agreed with this assessment: “I would say the Bluesburg teacher has more prestige (than working in a local school), because our school is quite famous in Singapore.”

By contrast, Brent felt that his contemporaries had no idea what Bluesburg was, so for him there was no prestige associated with working there. He did note that working at IBM would be a different matter. Although Eric granted that some people might feel that Bluesburg imparted a level of prestige, his opinion was that working there did not raise his own level of occupational prestige. Mark specifically noted that the “supporting role” of IT workers placed them in a certain level of prestige – regardless of location: “...if you think properly about, it doesn’t really make a difference because it’s still a supporting role.”

A modest level of prestige is not necessarily synonymous with an absence of pride. Eric asserted, “I can say that our team works very closely. We understand each other’s responsibility. I can say it’s the best team among all the international schools.”

4.4.2-2 The Prestige of IT Workers in Society

Eric located the prestige of IT workers in the middle of a broad spectrum of occupations. Echoing Brent’s observations about IBM, Paul observed that prestige was partly contingent upon the business sector: “In banking, it’s more. In a small business, a bit lower.” Paul also noted a kinship between his own occupation and the work of IT billionaires: “They’re from the same profession – which is IT – but the scope is different.”

Relative to other members of society, Paul clarified that the prestige enjoyed by the IT worker depended upon the level of the work: “If you are pure in supporting those low-end, that not be on par with doctors, lawyers, this kind of thing. If you are doing network administrators, network managers, you are sort of on-par.” Tech John agreed with this assessment:

We are well respected, actually. Most (people), when it comes to IT, if you talk to them more in depth, they respect you more because you know more thing in IT. They also sometimes like to learn more. Because, somehow, a lot of people, they need to use IT, whether at home or work, they want to find out from you. They more or less want to get to know you more.

4.4.2-3 Comparative Levels of Occupational Prestige

Each of the two occupations has been discussed in terms of their ‘isolated’ levels of prestige – without reference to the other occupation. However, an aspect of the research framework is the *relative* level of prestige between occupations. Were participants aware of hierarchy, and where did they see themselves within that order?

The association of occupational prestige with income immediately places IT workers in a disadvantaged position relative to expatriate teachers⁴.

Tech Graham: To determine the status most of the time you determine through their income...

Researcher: So that puts teachers above the IT guys, right?

Tech Graham: Correct. If you look at it that way, yes. International school teachers.⁵

Researcher: But in terms of standing in line, who gets respect in school?

Teacher Robert: Probably teacher then IT then secretary.

Tech John: If you are a doctor, lawyers, or politician, you are a higher grade. Teacher will be somewhere in the middle. Then if you are a technician you are a lower level. These are maybe society thinking.

4 IT Manager Walter reported that, based on salary alone, typical teachers earn triple the salary of IT workers. At the top of the non-management scale, teachers would earn 5 times the salary of IT workers, and “much more if all benefits are being received”.

5 Graham’s qualification of “international school teachers” begs the question of whether a similar income disparity exists between IT workers at Bluesburg and local school teachers. However, that avenue of investigation is beyond the scope of this study.

As an IT worker, Tech Mark's perspective was somewhat incongruous. Directly contradicting Betty, who maintained that IT was mission-critical for the school, Mark argued that IT was optional for teachers. He located teachers at the top of the relative scale, and then placed all support workers (including "the guy who makes your change") at the same level as the IT workers. Secretaries, in Mark's opinion, were a different case: "I have tremendous respect for them because I know the amount of work they do for the teachers so... I would put them the same as the teachers."

Teacher Marcia's views on relative prestige were markedly different. She did not see IT workers on the same "status" as teachers, placing them instead on a rank similar to secretarial staff because of their supporting capacity. Upon further reflection, however, she noted that...

...the difference is that, what I would ask a secretary to do, I know that if I had more time I could probably do it myself, whereas if I ask (Tech) John to do something, it's because I can't do it myself. So he's providing me with a service which I really, really need and I can't do on my own. So I respect his expertise in that respect.

Similarly, Teacher Bill noted that both secretaries and IT workers possessed knowledge beyond his own: "do I feel any greater than the secretary? Sometimes yes, often no, cause she knows more than I do about the thing I need to know about. Same with the IT guys. That's a personal thing."

One of the most striking assessments of relative prestige came from Tech Brent, who placed teachers just below management, and secretaries somewhat below them. IT workers, said, Brent, are "Just slightly higher than a cleaner." This ranking is surprisingly close to Teacher Greg's assessment of his assigned IT worker: "...he's almost like more of a skilled janitor, really."

4.4.3 Summary: Perceptions of Occupational Prestige

Teachers and IT workers both manifested differences between inherent and contextual levels of prestige.

Teachers typically manifested a 'defensive' approach to their own prestige, using the high standing of the school and their higher salaries to buttress their own sense of self. It was when teachers examined their prestige beyond the boundaries of the school that there was some decreasing sense of prestige.

By contrast, IT workers occupied – both by their own perceptions as well as those of several teachers – a relatively low level of prestige within the school. While teachers typically placed IT workers above the secretaries, two of the IT workers placed themselves below that level. However, in the context of the society in general, there was widespread recognition that the occupation enjoyed a good level of prestige.

4.5 Occupational Stereotypes and Culture

Participants from both occupations acknowledged the existence of occupational stereotypes regarding their own occupations. However, there was a marked difference in how the participants regarded stereotypes of the other occupation. While teachers were ready to discuss stereotypes of IT workers, there was a reluctance on the part of IT workers to discuss stereotypes of teachers.

4.5.1 Teachers' Self Perceptions

Teachers' own perceptions of their occupational stereotypes varied across intensity and favourability. Marcia's perceptions of the occupational stereotypes were initially positive:

Ah, organized. Punctual. Pretty patient, likes working with children. Probably a little bit over-enthusiastic about things. Yeah. Furiously writes lists and has lots of... trying to balance a lot of things at once. ... Most of my friends are teachers and we're anal planners for everything. ... They've probably got that "work hard - play hard" culture as well. They'll probably go out pretty late and get quite drunk.

Robert was not aware of any occupational culture.

Researcher: How about occupational culture? Because you grew up in it.
Does teaching have a culture?

Robert: (long pause) I suppose it must. I haven't identified it before.

However, Robert and Sally – both teachers – were aware of media portrayals of the occupation⁶:

⁶ Sally was present during the first part of Robert's interview. This was not an attempt to stage a group interview, but rather happenstance.

Researcher: What about (stereotypes) in the media?

Robert: I mean, the media, we're low-paid playboys. We work almost never and get paid nothing. And seem happy with that.

Sally: Low paid what?!

Robert: Playboys. Oh, yeah. Christmas off, we have all summer off...

Sally: Oh, playboy as in "playing".

Robert: Not as in the sexy part. Teachers are not sexy. In the media, that would be it. Watch any number of popular films, right? School of Rock.

Sally: Well, yeah. And those that can, do, and ...

Robert: (agreement)

Sally: So that's perpetuated in the movies, too, so "yes".

Researcher: Is there truth to that?

Sally: Could be, expect for it's a different skill set.

"Those that can, do..." was also mentioned by Steve and Bill:

Steve: On the other hand I think that we are also seen as just teachers. You know, those who cannot do, teach, and there's definitely an element of that.

Bill: Well, I don't know about juicy (stereotypes), but common ones: those that can, do; those who can't, teach. ...which there is probably an element of truth in, but only a little bit.

Later in the research, some participants were asked whether they would be able to pick out teachers on a transoceanic flight simply by observing them.

Jane: I can, I think they're loud, they're usually loud. Because they are very...

Researcher: They have to be.

Jane: Yeah, they get used to their voice. So... they're more instructive, and more lessons, they become like that unfortunately. I think we shouldn't be but unfortunately we are more directed. Like more instructive. So, I can just pick up their talking and I can say what they might be like when they're interacting with their kids and they're interacting with, you

- know, if they're hostesses or anything if you're meaning about planes. I can pick the way they dress. ... It's very teacher-like.
- Researcher: What does that mean?
- Jane: It's very teacher-like, I mean you see them like...
- Researcher: Dull? Conservative?
- Jane: Dull. ... It's a bit dull. They don't really care about fashion...

Jane later related this absence of concern for visual appearance to the relatively low salaries paid to teachers in the United Kingdom, further noting that this fiscal restraint should not apply at schools like Bluesburg, where salaries are much higher.

Teacher Greg recounted an anecdote that reinforced that stereotype. Upon hearing that he was entering the teaching occupation, people close to him said "well, you're going out to get your tweed jacket, then."

Teacher Shawn highlighted isolation as part of his teaching experience: "You'll never see me getting out of this lab, because there's enough work for me over here. Not that I wouldn't love to..." Wanda, as head of the academic Computing department, had noticed this isolation: "We have three of the four teachers in the department... one of them doesn't sit up there. And that's a really bad thing. ... I mean, the poor guy must feel terribly isolated. There are conversations that he misses..."

Teacher Greg, however, noted isolation as a positive thing. He observed that working in close collaboration with colleagues could be a source of annoyance. "...it's quite nice to have workmates that you don't spend so much time with that you'd actually get pissed off with... at least I can run off to the classroom now and again."

4.5.2 IT Workers' Self Perceptions

Possibly owing to language or culture barriers, it was difficult to gather information on IT workers' perceptions of their own occupational cultures. Although a strong occupational culture could be observed and was occasionally inferred in conversations, IT workers did not readily volunteer this information – with the exception of the "nerd" and "geek" stereotypes, which will be discussed shortly.

One of the strongest aspects of IT occupational culture was the expectation that members would be engaged in continuous learning. This aligns strongly with the IT work-

ers' definitions of "professionalism": IT workers had a tendency to avoid claims of professional status on the grounds that such a claim equated to an unattainable mastery over a massive domain of content.

Paul reported spending a great deal of his time – on a daily basis – learning new material: "It depends, actually. At times, maybe 70 to 30 percent. Maybe 60 to 40."

For John, learning accompanied his entry into technology:

John: When I was at my previous company, at that time the IT just came out. From there I worked hands-on; from there I learned. Then I upgraded myself with night classes or something like that. Then after that, when I came to this company I kept on doing the IT. From there you learn as you work. ... I went for Singapore Poly and also went for this informatic computer study. Those are the main ones. And then I went for those small courses also, to upgrade myself. Also when those engineers would come in to service our things, we learned from them also.

Researcher: Do you ever stop learning?

John: I think in the IT line you cannot stop. You can see that a lot of technology is moving very very fast. If you stop, I don't know what would happen.

Brent reiterated the importance of constant learning: "...definitely need a lot of time to study." Eric admitted to having a bookshelf of manuals, but also noted the need for constant "trial and error" in the learning process. Mark related the continuous learning phenomenon to a love of the subject:

Mark: ... to survive in IT you have to be interested in IT because it just keeps changing.

Researcher: That means you never stop learning doesn't it?

Mark: Yes that's right.

Researcher: How much time do you think you spend just learning the new stuff ... as a percentage?

Mark: I think well let me see maybe 60/40.

Researcher: So 60 old 40 new?

Mark: 60 old, 40 new yes.

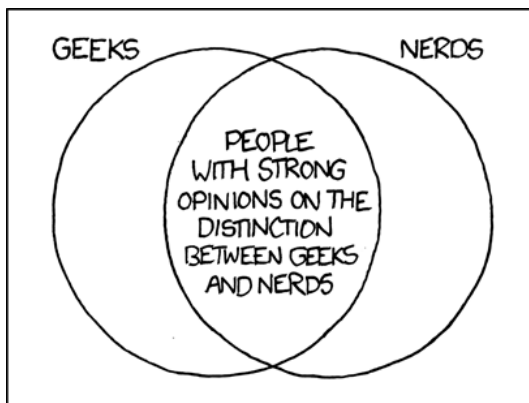
4.5.3 Geeks and Nerds

Among all the stereotypes and other observations of occupational cultures, the notions of “geek” and “nerd” were overwhelming, discussed in detail by members of both occupational groups. When asked whether there were stereotypes of the IT occupational cultures, teachers and IT workers both invoked the nerd/geek pair – sometimes distinguishing carefully between them.

Teacher Marcia, whose partner had worked as an IT specialist in a French research and design lab, observed a large number of “...single men who didn’t have girlfriends, didn’t wash a lot. ... Quite odd. Quite odd habits, that way.”

Wanda made mention of the difference between geeks and nerds, admitting that she was familiar with the following diagram (Munroe 2010).

Figure 4.4: ‘Geeks and Nerds’ Venn diagram



Tech Paul was asked whether nerds existed when he was a student:

Tech Paul: I did know IT guys. But it depends on their level of IT. Some of them are very in deep, so they are sort of nerds, and some of them not.

Researcher: Is “nerd” a bad word?

Tech Paul: Uh.... actually, I don’t think so. It’s based on how engrossed they are in their hobbies.

IT Manager Walter broached the term “geek”, and then qualified that he didn’t like to use it because it carried a specific negative connotation: that technical competence should rule out any other competencies:

Researcher: The guy who's standing there ... I say this with the utmost of respect, he's a geek. He's one of Shawn's better programming students.

Walter: ...you don't know that he's not a rugby player, or that he's in a play. And here, it's quite possible that he does those other things as well.

Researcher: It's like High School Musical⁷, isn't it?

Walter: (laughs) Yeah. Exactly like that. You can program **and** you can sing. But it's quite possible.

For Tech Graham, the difference between "geek" and "nerd" was one of degree:

Researcher: So IT guys are a specific type of geek?

Graham: Yes.

Researcher: Alright, nerd?

Graham: Not everyone, but yes.

Researcher: They don't mean the same thing?

Graham: They don't mean the same thing. Nerd is people who are just living in their own shadow world with something specific. So geek are just someone which is good at something... For me I'm in the middle of publishing something, I may look like a nerd or like a geek, but what I really feel behind me is engrossment.

Tech John offered further insight into the nature of the "geek". He denied that the word had overt positive or negative connotations, but he noted the following:

Researcher: Are you guys geeks?

John: I'm not really a geek, I must say. Some of my colleagues, they are geeks. They are really... especially my previous manager. He worked all the time.

Researcher: Is that good or bad or...?

John: Well, it's not good for personal, because you are too deep, then you neglect a lot of things. You may have to give up a lot of things because you are all the time in the computer.

7 Reference to a popular series of teen-oriented movies featuring a basketball player who also performs in school musical productions.

Teacher Bill – married to an IT worker – was able to discuss the concept of “geek” with a direct personal relevance:

Researcher: What about the other guys: the IT guys. Is there a culture there?

Bill: Hmmm. “Geek” culture, you mean. ... I suppose there’s a certain kind of person that can be drawn to IT. And if they don’t fit that type, they stand out, and the fact that they stand out suggests that perhaps there is a type, just as there is with teaching. In terms of stereotypes, yeah, I suppose it’s... whatever “geek” means.

Researcher: Well, what does it mean?

Bill: I suppose an interest in something that is so specialist and narrow that it’s not often appreciated by the masses.

Researcher: Does that mean that there’s an enthusiasm that isn’t shared?

Bill: Yes. And I think that’s why teachers have a similar effect on other people that are not in teaching – like, “Oh, my god, what would you want to do that for?” So it’s probably... but perhaps not using the term “geek”.

Researcher: So “geek” can actually transcend...

Bill: (laugh) “Geek” is reserved for the realm of science and IT, I’d say. And maths, also.

Teacher Jane, an IT teacher, also invoked “geek” as a concept, without prompting from the researcher:

Jane: It’s the same for the engineering that we talked, IT, engineering, those people are most necessarily, they’re really geek that we call, and they are more involved with what they’re doing than...

Researcher: Did you say “geek”?

Jane: Yeah.

Researcher: Okay. Is that a good word or a bad word or...? Just description?

Jane: It depends, I mean geeks know everything.

The theoretical relevance of the terms “nerd” and “geek” is that IT workers are associated primarily with “geekiness” in a value-neutral or value-positive sense: they are engrossed in their fields of geekiness, and they are highly knowledgeable in those areas – albeit perhaps to the exclusion of others. It is also relevant that this conception crossed the occupational boundaries of research participants.

Some participants also blurred occupational cultures by existing between them. Three of the teachers who participated in the study were also members of the IT (academic) department; along with the IT manager, all were teachers who had also worked as IT professionals.

Walter commented upon the possibility of putting IT workers and IT teachers in the same room:

Researcher: Could you tell who’s who by looking at their desks?

Walter: Probably. The IT techs’ would be piled high with computers, and among the teachers’ desks Wanda’s would be piled high with crap.

Researcher: Okay. Of course, she’s an IT teacher.

Walter: She’s an engineer, first and foremost.⁸

Tech Mark admitted that he had similar problems with tidiness:

Okay, my desk is particularly messy: I have so much stuff ... and my boss doesn’t like that sight. ... We don’t have time to be neat, man! I don’t have time to pack it up, put it aside, categorise it – come on!

4.5.4 The Ethical Aspect of IT Work

Most teachers were oblivious to the ethical aspects of IT work. Teacher Bill mentioned ethics, but misstated the case:

I’m sure within the world of IT, there must be rules... It may even be to do with confidentiality of systems being used and developed by the school in what is quite a competitive educational environment.

Bill’s error is that IT workers from international private schools regularly communicate with each other, sharing information of precisely the sort that Bill suggests they should not. This is not merely informal, occurring at the level of front-line IT workers, but

8 The dual nature of some research participants will be further discussed in Chapter 5.

extends up through to the IT Managers at many of Singapore's international private schools, who have semi-regular meetings to share all manner of information. Lower-level IT workers also share information about hands-on technical problems, calling each other to ask questions about specific technologies⁹.

While company secrets are not a problem, confidentiality of user data *is* a problem for IT workers. Even without access to privileged server accounts, an IT worker might be exposed to a user's private information. Tech John noted that, when servicing a user's laptop, he might need to know the user's password:

John: ...we are the people actually handling a lot of confidential data. Just for email or whatever data, if you're an administrator, you can go and take a look. It should be a professional thing...

Researcher: Do you ever look at it?

John: No. I try not to. Because I know that this is their personal thing.

Mark also reported an awareness of this access, being "very tempted":

Researcher: Were you ever aware of having a sense of self control or needing a sense of responsibility?

Mark: I told myself that the less I know the better it goes and sometimes it's like... I always think he's trying to hire someone to replace me, right, then what I'll do is that... I've got rights, I can look at his mailbox, I can do all that stuff...

Researcher: And nobody will ever know.

Mark: Yes correct I can do it in the middle of the night but the more I think about it is, the more I... if I would ever to start, make a start to do this then it would never end...

Researcher: That does require a sense of ethics though, doesn't it?

Mark: It does and it all comes back to what your value systems are.

Teachers Betty and Marcia were on the "other side" of issues raised by Technicians John and Mark. Marcia's computer had been infected with a virus of unknown origin:

⁹ The existence of these information channels was observed first-hand by the researcher, who worked as a member of both occupational groups before and during the fieldwork.

- Marcia: (Tech John) was working on it and there were a couple of other guys looking at it as well. ... I was "Oh, my god. I have no idea what's in my computer right now." But they can see everything and they obviously found that hilarious. ... But I felt that they could see things about me, or they presumed things about me, which I didn't know what they were, and I could defend them either.
- Researcher: Now, do you think that's real, or was this just your take on it?
- Marcia: It's probably my neurotic take.

As a technology enthusiast, Teacher Betty recognised the capability of IT workers to access and manipulate information:

- Researcher: Do IT guys need to have a sense of ethics?
- Betty: Absolutely. In many areas. Not least the ability to access data on the network constantly and dealing with the data. ... I think there's this misconception that some people are just one role – it requires technical skill and involves nothing else. I find that completely wrong.

The degree of privacy truly available in school IT systems at Bluesburg (and perhaps elsewhere) can be gauged by the actions of one of the IT workers, who wished to contact the researcher on a sensitive issue and insisted that neither person should use a Bluesburg email account for the exchange of information.

4.5.5 Summary: Perceptions of Occupational Cultures and Stereotypes

Axial categories emerged from the comparison and analysis of open codes, memos, and quotations drawn from semi-structured interviews. Notwithstanding that the conversations were shaped by an interview schedule, the analysis represents the researcher's interpretation of participants' verbally-reported realities. It is notable, therefore, that the dominant axial category was that of "relationships" and several dimensions thereof.

Chapter 5. Findings II – Perceived Aspects of Relationships

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The previous chapter has covered the first two specific research questions and the “occupational cultures” aspect of the third research question. This chapter will describe additional findings related to the essence of the study: how do participants perceive their relationships? What are the forces that act upon these relationships? How are these relationships manifested and perceived?

5.1 Socialising

It may seem obvious that relationships between occupational groups should be related to social behaviour beyond the working day. However, there is little of this behaviour at Bluesburg, and it is clear that the contrived socialising that does occur is not immensely helpful in bring the occupations closer together.

Techs Paul and John confirmed that IT workers – within their own department – were likely to go out together *ad hoc* on occasion, but that most social interactions with teachers only occurred in the context of more formal events, such as the Christmas Staff Party. Teacher Greg noted that he had played on a sport team with IT Manager

Walter (an expatriate), but that he hadn't done anything with Paul – his assigned IT support worker:

...from what I've noticed in Singapore, there does seem to be in the school a bit of a split between the expat staff and the locally hired staff. Partly it's down to the fact that the expats are mainly the teachers and the locally hired staff tend to be more support workers and there's no crossover there in which things can socially develop.

Teacher Alice agreed that there was a subtle barrier. Asked whether she was likely to engage her assigned IT worker in a "chat", she replied:

Ordinarily? There's a lot of things going on. A lot of the technicians are local and so I think that is ... if you're getting toward the social aspect – would you go out and have a drink with them... I'm not saying I like it, I think there is definitely a division here between Singapore staff and overseas staff.

Insofar as teachers were likely to be expatriates and IT workers were likely to be locally-hired, occupational cultural boundaries and national cultural boundaries reinforced each other.

Tech Brent confirmed that socialising outside the department was unlikely, noting that, during staff parties, the IT workers would stay together "as a department" rather than mingling with teachers. Teacher Betty explained this division in terms of common work interests: "The culture is their diverse interests. Very few teachers will be interested in whether our Active Directory is working or not, or whether you can plug a Linux machine into the school server."

Teacher Betty tried to engage the IT workers in less formal settings, but failed:

One, there's a certain degree of linguistic barrier, and second, there's a very clear cultural barrier. A couple of times I sat for a cup of coffee with them I felt like I was intruding. And that, I respect.

The social isolation of IT workers from teachers is also affected by work schedules: an ideal time to repair faulty equipment is when the teacher is not instructing: the teacher's lunch break. Tech John notes that the IT workers' lunchtime is different, making it less likely that the two groups will interact.

Teacher Marcia, discussing earlier experiences with IT workers, related intra-occupational socialising difficulties to occupational cultures: “I wanted to talk about books that I’d read, and the kinds of books that (they) were reading were really not related to my field at all. So I did struggle to connect with those people.”

It is significant, then, that IT Manager Walter mentioned his attempts to socialise with his team – with an important inclusion:

Researcher: Do these guys socialise with the teachers?

Walter: Not the general teachers as a group. As a departmental thing, we socialise. So every 2 or 3 months I’ll take them out. We go out... that’s my departmental esprit-de-corp team building as opposed to genuine friendly socialisation. ... I take them out and get them drunk. I find out the real deal.

Although Tech Eric noted that Walter “very seldom” promoted the identity of the team, it is important to note that this social activity is likely to include the Computing Department as well as the IT Support Department. There are two possible reasons for this. First, Walter is a member of the Computing Department in addition to his role as IT Manager. And second, these two departments share some office space: three members of the Computing Department are in the same physical space as the IT support workers.

The following exchange with Tech John reveals the existence of occupational barriers that extend to the social domain:

Researcher: Do the teachers ever come in here (to the IT office)?

John: Okay, for teachers, when they have problems, they will give us a call. Either they come to look for us. So then we have more communication. But here, because we are the same, we have things in common. Sometimes we have meetings.

Researcher: Do you guys take lunch together?

John: For our technicians, we do, yes. Most of (the time) we do eat together. Let’s say we have urgent work, then we would try to finish it; after that, then we would go for lunch together.

Even without direct prompting, John distinguishes “technicians” from “teacher” when discussing lunchtime companions.

Tech Graham highlighted the difficulty of establishing a relationship with teachers:

If I were to ever approach a teacher and begin a conversation with them, the first thing they would tell me, “Graham, my wireless is not working fine.” So that’s a very tough way to get into a conversation.

5.2 Racial Discrimination

Teacher Shawn had been an IT worker at other international private schools before his teaching duties at Bluesburg. He reported that racial discrimination was *not* an issue at Bluesburg, but that it had been a problem at some of his earlier posts. He was the only participant to discuss racial discrimination, noting that – in his experience – it was related to location: “...if you were to ask these questions somewhere in the Middle East, or somewhere in India, you would get so much stuff. Because I could see discrimination there happening.”

Although it is possible that this distinction is related to Shawn’s own shift in occupation, two other possibilities must be considered. First, the national milieu of Singapore – being in an avowedly multicultural country – could discourage overt racial discrimination. Second, the school’s ‘global’ ethos – articulated through its hiring and enculturation processes – might play a part. Teacher Bill mentioned this possibility: “...you’re dealing with Bluesburg, where people feel obliged to have certain attitudes to people... there is an expectation of a tremendous respect and courtesy for others...”

5.3 Exploitation

Within the broader concept of “relationships” lies a subtle distinction between “exploitation” and “customer orientation”. While IT workers profess – and manifest – a commitment to the latter, they may feel themselves subject to the former. Exploitation occurs when members of the school community expect IT workers to help with *all* technology problems, including those that affect their computers or software not related to school work.

Wanda noted that there was a cultural component to the problem:

It’s certainly Asian. This idea of you say “yes” to your boss. You don’t say “no”. It’s bad to say “no”. It may be difficult. Which is why when possible you phrase questions, “Is it better to do this or this?” Rather than, “Would

you do this?” ...(Tech) Eric is now at the stage where me where... I often ask him to do something and he says, “Can I do this instead?” And that’s fine. That’s probably as close as he’ll get to saying “no”.

Teacher Jane also observed this reluctance to refuse requests:

Researcher: Are the IT guys allowed to say no?
Jane: They don’t usually, they don’t say that.
Researcher: Should they?
Jane: I think they should.

Tech Graham confirmed that ITWs could be asked to work beyond their job scopes:

Researcher: Are they allowed to say no?
Graham: They are always allowed to say no.
Researcher: Do they know that?
Graham: They know.
Researcher: Do they?
Graham: They don’t (laughing).

IT Manager Walter agreed, noting that IT workers and teachers were both part of the problem. IT workers, he said, were “...more respectful than they should be, in some cases”, and teachers might ask them to do additional work – “They know that they (the IT workers) are not going to say ‘no’.”

A further cultural aspect of the problem lies in the nationalities of those making excessive requests, singling out Singaporeans:

Graham: (They are) Very good at asking, demanding, “Can you help me do this? Can you help me do that? Can you give me this?”
Researcher: Is it easier to say ‘no’ to Singaporeans or harder?
Graham: I’m not sure about them (other IT workers), but for me it’s easier to say ‘yes’ than to say ‘no’ to Singaporeans, yeah.

Graham later singled out Singaporeans again as being particularly demanding in the context of customer service.

Tech Eric, however, asserted that unreasonable requests could come from anywhere: any nationality, and any hierarchic level of the school. Teacher Betty concurred, noting that, while some teachers were thankful for the work done by the IT workers, "...some treat them like, 'I want this done now.' To the point where they ask them to do something that they shouldn't be doing."

Teacher Betty observes that IT workers will typically not refuse to perform such tasks, but "...they'd start complaining and Walter will send a message to all the staff reminding them what they should do."

Teacher Steve, in describing his relationship to Tech Brent, recollected an incident in which Brent had helped him with an item of personal technology – without apparently recognising the possibility that Brent might not have been eager to help. However, Brent, in his interview, cited a positive relationship with Steve. It is possible that the distinction between "exploitation" and "happy assistance" is subjective and contextual.

Ex-Tech Mark asserted that exploitation was more likely to come from higher-level people, and could include off-campus work at the home of a teacher/administrator who demanded help with a computer.

Noting that he gets an average of two "exploitation" cases per week, Eric confirmed the flexibility of the definition. Whether he provides assistance or not, "...depends on the teacher, or the relationship with the teacher." Eric also stated that his willingness to grant the favour was irrespective of the hierarchic rank of the person asking.

Although he did not accede to all requests for assistance, the requests that he *did* grant used – on average – three to five hours of additional time per week. A typical request, he noted, might be the repair of a personal laptops for teachers or teachers' children.

As a middle-manager for technology, Graham noted that he advises the technicians to refuse such requests, and that they understand the reasons for his asking this. IT Manager Walter also recognises the existence of exploitation, in the form of teachers asking IT workers to perform tasks that they could or should do themselves.

Teacher Wanda notes that the problem of exploitation lies partly in that the parameters of IT workers' jobs are not sufficiently clear to any participants. Teachers might cross the line partly because they are not aware that it exists, but also because they might not be aware of the implications of their requests. What might appear to be a simple job might actually involve a great deal of time for the IT workers. And IT workers, she adds, might fear for their jobs if they turn down requests.

This type of situation arose for Teacher Shawn when he was an IT worker in a previous school. Faced with a teacher who demanded something that was technically impossible, he attempted to explain the situation. The teacher's response was, "No, I won't. You either do this for me, or I'll complain."

It is important that exploitation was not discussed purely by IT workers, but also some of the teachers – notably Betty, Walter, Wanda, and Jane. These four individuals will be mentioned later in this chapters as "Bridgers and Tweeners".

5.4 Customer Orientation

The "customer orientation" of IT workers is the companion of exploitation, existing close to each other on a spectrum of engagement with the school and its community. Teacher Wanda related it to the inherent nature of the IT workers:

I know they do tend to try and help out people where they can. But they're good guys. They're nice guys. They like helping people. And they like being able to do what they do.

As a former salesman for IT companies in Singapore, Graham 'imported' his customer service orientation from the business world, noting that his 'internal' customers – meaning students, teachers, and administrative staff – communicated their expectations more clearly and were more lenient than might be expected in a commercial, 'external sales' context.

Tech Paul emphasised the importance of the communication in building the relationship. Asked how a good relationship might be built, he answered, "Listen to their problem; listen to them. Why is it occurring. And tell them how I am going to do it. They like it this way. Also, they like the speed, especially. They like it fast." Paul's focus is clearly on the *teacher's* perception of the process, rather than merely a solution to the problem. He also noted that his *relationship* skills were developed as a result of his work situation: "...it's based on exposure – the problems that we have, that we face."

Part of customer orientation is the recognition of the teacher's perspective. While *some* situations may involve an explanation of the problem and procedure, other teachers may be uninterested in these details, as noted by Teacher Wanda:

Now bluntly, I think it's hard enough getting well qualified techs ... and to then ask for someone with communication skills to deal with inexperienced, and in some cases bluntly, uninterested teacher. They don't want to know how it works, they just want it to bloody work, now! ... They don't want to know what's going on, they want it to work. They don't have an interest in geeks. ... They want to get in the car and drive it, and that's what the techs are there to make happen. They see that.

Tech John recognised the supporting role played by IT workers: "We have to support the teachers; we have to support all the offices, also. ... if they have problems, we have to help them get that thing (running) smoothly."

This commitment to assistance is appreciated by Teacher Steve:

Everybody that I've seen here has been outstanding. It's interesting too, outstanding not only in terms of knowledge for what they're doing but in terms of the service element as well. Honestly, I think I've barely hit send on my e-mail saying 'Hey, I'm having trouble with my x' and Brent's down here asking how he can help and what he can do. It's absolutely fantastic...

Teacher Robert also noted the speed with which Tech Brent provided service: "...he'll come really quickly. He'll even answer his phone during lunch, which is impressive." Teacher Bill spoke highly of Tech John: "He's a really nice, helpful guy that will go out of his way to make your life easier. Possibly at the expense of his own needs and time management, he will go out of his way."

Teacher Sally noted the polite quality of IT workers, but more importantly, she mentioned their willingness to work within the teachers' constraints: "I think they respect, 'I need this done really soon' or 'This is my free period; can you come in and help me then' and they try to accommodate that as much as possible."

Teacher Jane argued that the flexibility and helpful nature of IT workers could be counterproductive: "People get more frustrated if you keep saying 'yes'." She went on to illustrate a situation where IT workers might have work piling up with attendant delays because of their willingness to take on additional tasks.

Tech Eric was familiar with this scenario, noting that he was forced to prioritise (and occasionally refuse) requests. However, "...if your boss comes and tells you 'It's urgent. Please!' you do it. Right away." Competing requests were also mentioned by Teacher Bill: "...they're being pulled in all directions."

Tech Brent discussed the inherent danger of a customer service orientation, particularly insofar as it was an aspect of the organisational culture. Having worked at another international private school in Singapore, he noted that his previous employer had placed more restrictions upon teachers. “Teachers (at the other school) know their limits.” Bluesburg, he suggested, was wasteful in terms of resources, since teachers were entitled to ask for things which he felt were unnecessary.

Teacher Howard singled out another psychological aspect of IT worker: their ability to be calm in the face of teacher frustration: “I’ve never seen them edgy. ... I’ve seen them always calm, and I’ve commented on that a few times.”

5.5 Difficult Teachers

Despite the efforts of IT workers to provide service, however, some teachers are difficult to work with. Tech Graham observed that part of the IT workers’ jobs was “... definitely a matter of managing expectations and certain people.” The reasons why teachers might be “difficult” are both varied and apparently contradictory.

Tech Brent felt that teachers at Bluesburg felt entitled to make more demands than those at another school where he worked¹. Tech John also singled out the making of demands: “...if they are demanding without any reason, that’s quite difficult. Because if they want something that we can’t (do), then of course, we have to handle properly also. But these are very, very rare.” Perhaps because of the rarity of such cases, there was some contradiction amongst IT workers as to the causes of the difficulties.

Tech Paul found that it was the older teachers who offered greater challenges, since they were unaccustomed to newer technologies and perhaps lacked the skills and understanding needed to use these new tools correctly.

On the other hand, ex-Tech Mark felt that older teachers were “more forgiving” since they didn’t use much of the technology. The younger teachers, by contrast, were more challenging:

¹ It may be relevant that Tech Brent’s earlier school was for-profit, while Bluesburg was strictly non-profit.

Researcher: Maybe they figure ‘this works for me at home why doesn’t it work here?’

Mark: That is the most common question they ask actually. Whenever you give them an answer they say that, you know, this doesn’t work here because of some security settings for example. They say, “No at home it works; why doesn’t it work here?” and I’m like, “It’s a school – it’s a different thing.”

Tech Eric was of the opinion that age or computer experience weren’t issues at all, and that difficulties were more a matter of the teacher’s attitude toward IT support:

“Classic example: ... the request is, they will just tell you that it’s urgent. Where, after you fix it, they don’t use it. It’s not something that you can’t live without, just that they need it to be done, so they call it “urgent”.”

Even without “exploitative” requests, Eric notes the size of the task facing Bluesburg’s IT support crew: “I would rather say that they don’t understand the nature of the job. ... it’s just five technicians handling over 800 computers – excluding almost 400 laptops.” Although some teachers were described as “polite” in the face of this situation, Eric described some other teachers as “arrogant”, “nasty”, and “demanding”.

Paul described one teacher as a particularly difficult case on account of his lack of flexibility: “What he wants, ABC, you must give it ABC. Or rather ABCD; not minus A or minus B.” Shawn experienced similar inflexibility as an IT worker: “I’m trying to tell her, ‘you cannot do this’. The teacher does not like to hear “cannot”, because they’re a ‘can’ person.”

Teacher Wanda highlighted an occasional lack of technical understanding and communication skills on the part of teachers – similar to Shawn’s situation. She enacted the following as a kind of “typical dialogue” between a difficult teacher and an IT worker:

Teacher: It doesn’t work!
IT: Why doesn’t it work?
Teacher: It just doesn’t!
IT: Well, why doesn’t it work? What have you tried?
Teacher: But it doesn’t work! Whatever I do it doesn’t work.
IT: Yeah, but *what* doesn’t work?!

Tech John isolated a key difference between types of teachers in their willingness to engage in “self-help” activities. Notwithstanding the greater demands of younger, more tech-savvy users, he found it was important that teachers should be willing to help themselves. The more difficult teachers are those that never learn or never try: “Some of them... are scared of touching those things.”

Irrespective of age, Tech Paul highlighted several teachers who were very good to deal with (including Shawn). These teachers were familiar with technology and were able to understand why certain problems might arise and how to deal with those frustrations.

Teacher Betty admitted that, in some situations, there was a problem in the matter of respect: “...in some cases I’m afraid there is a problem with respect. They (teachers) treat them (IT workers) like second-class citizens. “I need this done!” There’s no question of whether, first, are you supposed to be doing this or not?”

Beyond immediate confrontation, there exists the problem of complaints. Tech Brent noted that at least two teachers presented contradictory appearances: “in front of you, they smile. But behind... sometimes they will complain because there are things I can’t control.” Tech John also observed this phenomenon, although the complaint came from a non-teacher. The problem for both John and Brent was that the complaints were made to an upper-level manager in the IT department, rather than directly.

Tech Paul observed that, although some teachers might occasionally bring gifts of thanks to the IT department, this was never done by the most difficult of teachers.

Even Tech Mark, who was well-known among the teachers for his affability, had to approach certain teachers with particular finesse:

Now for me it’s this: when I attend to Robert I immediately preprocess him. First, I told myself that “Okay, this guy is not a hardcore like Betty, he’s not a hardcore like Walter, give him a break. He might not be able to do some things that you think is very simple.” So I told myself “It’s okay; keep it calm.”

5.6 Difficult IT Workers

If “difficult teachers” might be regarded as those having unreasonable expectations, then “difficult IT workers” might, conversely, be those who fail to meet reasonable expectations.

Teacher Howard noted that some of the difficulties between IT workers and teachers lay in the disjuncture between the services teachers required and those that IT workers were able to perform. Bluesburg serves students from ages 4 - 18; each grade level and each subject may have several hardware and software technologies to support curriculum and instruction. Faced with this array of resources, IT workers cannot be experts in all devices and all programs, hence Howard’s qualification: “I think our problems could be solved faster, but I don’t think it’s a relationship problem if ... Brent cannot solve some of my problems because he’s not a software specialist.”

Teacher Bill noted that IT workers operate on “clock time” while teachers operate on “period time”, leading to perceptions of unresponsive behavior: “And so you might hear in the early days a comment of ‘bloody hell, where is he, whoever this person is?’ until they get to know them (the IT workers)”.

Teacher Marcia’s anecdote about the virus-infested laptop (described in section 4.5.4) is again relevant because of her feelings of embarrassment and powerlessness: “I felt that they could see things about me, or they presumed things about me...” Although she admitted that this was her *perception* of the situation, it still highlights an area of potential difficulty between the occupational groups.

Tech Eric noted that intra-departmental conflict could arise from a perception that some team members were not carrying their share of the workload: “Sometimes, I would say... it’s just something like when teachers throw you a question or throw you some problems. Humans tend to be lazy sometimes.”

Teacher Robert observed the following about his assigned IT worker:

So he comes and looks at it and then he says “hmmm” and then he goes makes some phone calls or seeks further guidance and comes back and if it’s a complex problem, it could easily take a day to fix. ... I guess he is a bit of a self-starter in that he seeks his own solutions to things he can’t do, but he is not as skilled as... also his language skills are not... he’s not a first-language speaker, and that hampers him, too.

5.7 The Kicked Chair

Nearly all research participants offered personal stories that encapsulated some aspect of their relationships with the other occupational group. These stories had the characteristic of being a single, extended speech, even where the participant had earlier offered only short utterances.

The recounting of these stories is beyond the focus of this study, but one story in particular is important because it was told by one of the teachers and three of the IT workers – including ex-Tech Mark, who had left Bluesburg a year earlier, and the teacher who was the focus of the story. This anecdote emerged – independent of prompting by the researcher – in response to questions about relationships between the occupational groups. In brief, the tale is that a teacher became frustrated with perceived technological inadequacies and vented his anger by shouting and kicking a chair in the presence of an IT worker.

Related to this event, Tech Brent observed that he had difficulty defending himself in such conflict situations. This was a problem that transcended language, and was, instead, an inability to respond to the other person's state. This tale was also mentioned in the context of teacher professionalism. Techs Paul and John highlighted teachers shouting as an example of non-professional behaviour on their part.

What is far more important than the story itself is the mark that it left upon the IT department. It became a component of the occupational culture of IT workers at Bluesburg. In the following chapter, this story will be reviewed in light of occupationally-related neurodiversity.

5.8 Entering the Classroom

In considering Hargreaves' (1994: 166) four forms of teacher culture, a 'test case' was presented – wherein a teacher requires the services of an IT worker to secure the proper functioning of technical resources. Four participant perspectives on this are particularly important.

Teacher Robert noted that, when an IT worker came into the classroom, there would be minimal contact: "...he'll furiously work on it and get in going. Yeah, he's unobtrusive... he just works very industriously to get the job done. I appreciate that."

Teacher Bill observed the following about Tech John's work style:

...comes in, does what he's gotta do... and then rushes off to his next job. Not that Mark had much more time, but he would just find the time for a very quick chat. ... it's odd having anybody in your classroom, because the kids are fascinated and immediately your lesson goes down the Swanee. (Tech John is) very discreet and very quiet.

Teacher Howard reported the following characteristics of visits by Tech Brent:

Researcher: What's that like? What does that do to the class situation?

Howard: Nothing. Nothing. ... I welcome him in, "please, fast!" No, nothing with the students. No, he's a technician.

A complete treatment of the social dynamics of this situation is beyond the scope of this study, but it seems significant – particularly insofar as IT workers do not appear to relish such a visit.

Tech Graham said that he occasionally observed what was happening in teachers' lessons: "One of the things I like to do sometimes when I take a break is to always go down to the science classrooms standing there looking at the teachers teaching the students, which gives me a lot of ideas..." This is not an intrusion, as Graham does not engage the teacher during or after this observation – on either social or professional bases.

From the IT workers, Tech Mark's recollection of a specific teacher is noteworthy:

...every time I entered the room he would say something very funny and I would laugh to bits and I would sort out his problem... I had a very happy time because I laughed the whole time when I was supporting him.

It may appear that the best repair job is one that involves no interaction between the two occupational groups; the only value of the IT worker's visit is the return of full functionality to the teacher's technologies – except that teachers who break from this pattern clearly make a significant impact upon the IT workers with whom they interact. These four perspectives all reinforce the typical separation of teachers and IT workers. This topic will be revisited in Chapter 7 – Tactical Disjuncture.

5.9 Bridgers and Tweeners

An important finding of the research was the existence of two subtly different varieties of intermediary between the occupations. These are tentatively referred to as “bridgers” and “tweeners”. The existence of both types of individuals was observed in their words and in the actions which they and others reported. “Bridgers” and “tweeners” both form a nexus where both occupations meet; the difference lies in the degree to which this is independently chosen or contractually defined. Whereas “tweeners” occupy job positions that explicitly place them between the occupations, “bridgers” seek to interact with the other occupational group in ways that transcend their strict job titles. While the bridger’s interest might be technical, there was often an accompanying personal component to the relationship.

5.9.1 Tweeners: a Job with Intermediary Aspects

The clearest example of a tweener was IT Manager Walter, a fully qualified teacher as well as the manager of the IT workers. His job was the provision of technical services and resources to the school, and in this capacity he necessarily took part in both occupations.

Walter reported that his own identity was occasionally in question: some teachers were only aware of his work in IT management. Some IT workers, too, noted that Walter’s hands-on work was necessarily limited in scope. A further complication in Walter’s identity was that he was a ‘rank-and-file’ member of the Computing Department.

A number of teachers were aware of Walter’s dual identity, specifically noting that his teaching activities lent “credibility” to his activities in technology management. Because he also taught, the decisions he made in terms of technology were seen by several teachers as being grounded in teachers’ occupational realities.

As head of the (academic) Computing Department, Teacher Wanda was not directly affiliated with the IT support system. However, she shared an office with the IT support workers. When Teacher Alice was asked to identify “IT workers”, she grouped the IT workers under the “IT department”, and then named both IT Manager Walter and Teacher Wanda as being members of that department.

Wanda herself admitted to having this dual role. There are two entrances to the departmental office – one of which is directly adjacent to a stairwell, the other is by way of a classroom.

- Wanda: I always, wherever possible, walk through that classroom rather than up the back stairs. The techs always take the back stairs. I always walk through the classroom because if there's not a lesson going on, it's, "You've got too many words on that PowerPoint slide" or, "You've got..." You know?
- Researcher: That's a very teacher thing to do, of course.
- Wanda: Do you understand what I'm saying? I'm there as a contact. I will initiate conversations. And offer and leave.
- Researcher: Right. Is that with teachers? Or with students? Or both?
- Wanda: Everything. ... that's one of the unofficial jobs I give myself.
- Researcher: That's the interface part, right?
- Wanda: That's me being an interface unofficially. ... What I see as my role. I make people use IT better. I don't make the IT better.

Other individuals holding "tweener" positions are those who act as liaisons for technology. At a previous school, Teacher Marcia was responsible for the school website. Teacher Bill was the departmental expert in one of Bluesburg's e-learning systems.

5.9.2 Bridgers: A Personal Desire to Connect across Occupations

By contrast, "bridgers" are individuals whose intermediary efforts are voluntarily assumed. There are few – if any – aspects of their contracts that require them to act as inter-occupational intermediaries. They are the enthusiasts whose passion to engage with members of the other occupation overcomes the inherent barriers of language, national culture, and occupation itself. In time, one might suspect or hope that bridgers might be allocated formal "tweener" positions that might give them the time and purview to exploit their enthusiasm.

Teacher Steve described himself as "a bit of a geek", noting that this enthusiasm was an aspect of his positive relationship with Brent, his assigned technician. When he and Brent worked on a technical problem, he described it as a "personal relationship exchange".

Teacher Betty was also an enthusiast, with a focus on technologies themselves. Although not a member of either the Computing Department or the IT support team, Betty was deeply involved with the school's technology advisory group, and was observed to be a frequent visitor to the IT office. During her interview, she spoke strongly about the importance of technology and the people supporting it. She asserted that

IT was “mission critical” and that the school could not operate in its absence. Though not strictly a member of the IT support crew, she had frequently acted in support of technology in concert with the IT workers.

Teacher Jane saw herself foremost as a teacher, but had done some professional work in technology. She professed an enthusiasm for the subject, as well as an admiration for the skills of the IT workers and a love of technology itself: “I really do love teaching; I love IT.” A member of the academic Computing Department, Jane was recruited as a research participant because she had claimed a desk in the IT work room (see “Geography”, below). Her desk was in an inopportune location, as it was effectively in the way of most people in the room. However, she maintained the importance of being there in order to remain in touch with both occupational groups. Tech Graham noted her location – “she sits here very near to us; that’s why we blend with each other very fast” – and that his conversations with Jane extended beyond IT and into subjects such as “her pets, you know, her husband, and things like that”, but that his conversations with other teachers did not feature personal information.

Jane was observed engaging the IT workers in a conversation over coffee, in precisely the manner that Betty had described as being ‘intrusive’. When asked about this, Jane emphasised: “I basically pushed myself in so I love doing it and people should do the same for everybody else. I’m working close with them so I need to know them.” Jane noted that neither IT workers nor other teachers attempt to engage in this kind of deep personal contact. However, she felt it was important to break the boundaries:

Why do I do that? I respect what they are doing. I want to have some skills that they have. ... (other people) don’t want to communicate; there’s no reason to socialise with them. ... they do have different cultures but I find it quite interesting, for me it’s an interesting thing to learn about.

Former IT worker Mark, who had previously occupied network manager Graham’s position, was similar to Jane in his emphasis on relationships. His participation in the study was vigorously pursued, even though he was no longer an employee at Bluesburg, because of the number of teachers and IT workers who had mentioned his excellent relationships across occupational boundaries.

Sally: He actually was extremely busy but would have time to stop and talk. And he would be one that I would actually carry on conversations with. ... And also, the big smile. Very approachable.

Researcher: The conversations with Mark: always about IT?

Sally: No, no. About his daughter. He had a baby about maybe four years ago. And he was nervous about that. More personal than anything. Well, personal and IT. But he was not ever my technician.

Teacher Bill also spoke highly of Mark's interpersonal skills:

Mark was just sort of a really nice... person. Very outgoing. Very popular amongst teachers. I would say whether he was attached to your department or not, he was the one known. It was a name, whereas I wouldn't know who was with Geography; who was with Maths ...Mark would go out of his way to ask about your family and would remember things. ... he would just find the time for a very quick chat.

IT Manager Walter had worked with Mark, and recognised his non-technical skills:

The thing about Mark was, he was a brilliant people person. Left you thinking that he'd solved your problem or that he was going to do it very quickly. And in lots of cases he did, but the problem was he jury-rigged a lot of those solutions.

Insofar as Mark clearly had exceptional relationships with teachers, it is helpful to understand his perspective on these relationships:

Researcher: Did you have to work at building relationships?

Mark: Sometimes.

Researcher: Was it something you were aware of trying to do?

Mark: Yes and no. I think it depends on a personality. Sometimes you know that he's not my flavour, (so) I have to work on it.

Mark's perspective on relationships is best summarised in a single phrase: "...support the humans."

5.10 Gender

At no point in the study was gender mentioned as an immediate factor in relationships between teachers and IT workers. Instead, it emerged as an aspect of other issues. IT Manager Walter noted that he has seen more IT teachers who are female than male – possibly broaching a discontinuity between gender patterns in IT and education:

...in my experience, it's true in our department and it's true even when I was training, that actually there are far more female IT teachers than there are males.

Walter indicated that it was merely coincidence that the only female IT worker on campus was assigned to the elementary school. Gender was also mentioned in the context of communication, with the claim that females are inherently better at it:

- Jane: ...it is important, I think, to have females in the IT department to make more communication.
- Researcher: In your opinion are females better at communication than males?
- Jane: Ah, that's a tough question. In this subject area, yes. In this subject area they are hard to find, not necessarily.
- Researcher: You mean good, good male communicators in IT?
- Jane: Very less. Very less.

Gender was mentioned in the context of students helping in the classroom (only males) and in the context of communication.

Tech Graham asserted that gender was not an issue in staff familiarity and comfort with electronics: "... you've seen ladies getting comfortable with electronics nowadays because it has become an essential part of life."

5.11 Geography

The physical location of IT workers relative to teachers was noted by several participants. In addition, the geography of the IT support workers enabled a number of theoretically rich observations.

At Bluesburg, the IT workers are physically located near the geographic centre of the school, so the maximum travel distance for any service call is roughly the radius of the school grounds. Teacher Shawn noted the effect of the school size on the pace of the IT workers:

And being the school this is, they run around the place. ...if you look around you will see Paul running around here and there. You will see John running around. ...I've seen IT guys run around like crazy. I don't blame them, because... it's such a huge school and every classroom has at least two computers.

One of the notable aspects of geography at Bluesburg was the layout of the IT office itself. As shown in Figure 5.1 (following page), it is a space of about $\frac{2}{3}$ of a classroom occupied by five IT workers, the IT Manager, and two teachers in the Computing Department. (The IT Manager also teaches in the Computing Department.)

Although this arrangement is physically cramped, it appears to have some positive aspects. Tech Graham noted that the proximity led to positive relationships:

Graham: I think it's quite nice the way we've been located... we are very close to each other. ... Of all the companies I've worked with, most friendliest, most easy to work environment.

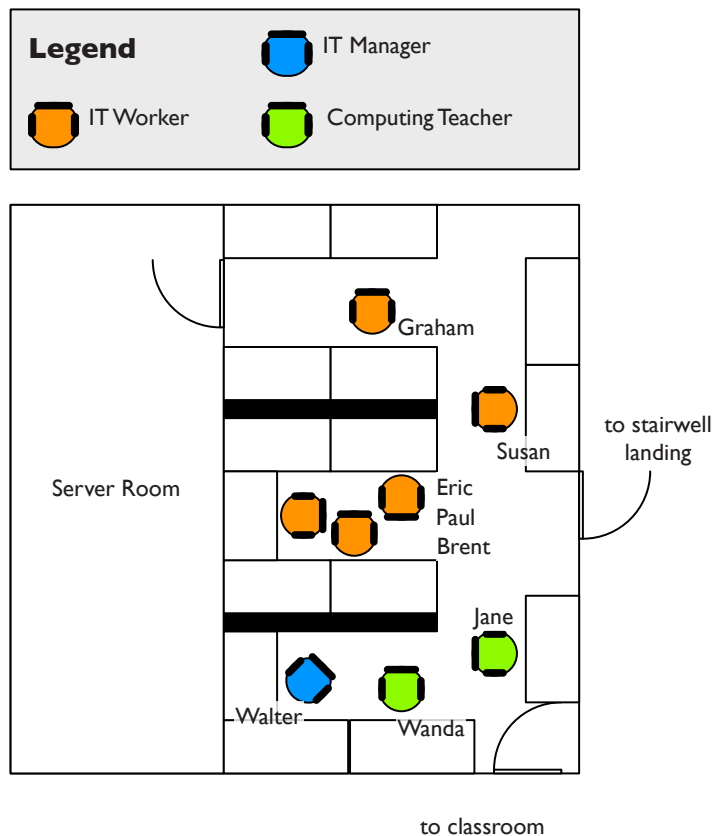
Researcher: Do you do a better job here as a result?

Graham: Yes I do. In fact much more efficient than what I did in the past.

Teacher Wanda observed that, in an English school in which she had taught, the school had placed IT workers "...in a separate office. Two of them sat in a separate office a long way away." She further noted that having the academic and technical functions in close proximity at Bluesburg was both good and bad.

It's (good) because it allows me to know what's going on. It's a pain in the ass for them because I can yell through the door, "Internet's down again!" ... I probably spend less time trying to sort out technical problems than I

Figure 5.1: Physical geography of the IT office



would if I didn't just haven't to stick my head through a doorway. On the other hand, that gives me more time teaching the kids. Which is my job.

However, Wanda also noted that being placed with the IT Support Department annexed the Computing Department itself within an 'island', rather than integrating with other subjects in an effort to integrate technology into other departments – potentially leading to some confusion: teacher Alice, when asked to name some IT workers, misidentified Wanda specifically because of her physical location.

IT Manager Walter initially noted that the two departments (academic and support) were together because of space constraints. However, he added that this arrangement might continue in the future:

But in my ideal office... the IT infrastructure guys and the IT teachers would be together in a larger-plan office. Where one side of the room would be techs, and the other side of the room you'd have teachers sit together, but we would physically put them together in a kind of IT super-empire.

During fieldwork, a cake was casually passed around the office, crossing the boundary between occupational groups without comment or notice. Some (but not all) members of both groups took a piece. This evidence suggests that the physical integration of IT workers and teachers improves relationships between the two groups.

An observation, made initially by a teacher and later confirmed by an IT worker, was that IT workers have ‘private’ conversations that are not intended for the ears of *any* other members of the staff – even members of the Computing Department or the IT manager. These conversations might occur in an empty classroom on campus or even off-campus. So although a physical merger of office spaces may improve relationships between occupations, it appears that a complete integration across occupational boundaries is unlikely to occur.

5.12 The Unexpected Finding: Secretaries

This study set out to investigate perceptions of relationships among teachers and IT workers. Although relationships between IT workers and secretarial staff are beyond the scope of the study, it is an aspect of school relationships that was mentioned repeatedly by IT workers and, as such, demands at least some recognition – if only as a prompt for future study.

Given the obvious differences in occupations, it was expected that tension should be highest between teachers and IT workers. It was, however, secretaries that were singled out as the chief source of frustration among IT workers. Asked about relationships with teachers, Tech Brent named *secretaries* instead, without any prompting:

Researcher: Do all ‘troublesome’ teachers have something in common?

Tech Brent: I’m very fortunate, in that my secretaries are good to me.

The implication was that secretaries were expected to be difficult.

Tech John offered a similar response. Asked about unhappy relationships, he asked “For the teachers or the administrative staff?” This was pursued with direct questioning:

Researcher: Do you get more trouble from teachers or from staff?

John: I would say, for me, personally, it’s from the admin staff.

John developed this theme with an anecdote regarding a particularly demanding and unpleasant secretary, later adding:

...they think that they're higher, you see. ...but the teachers are actually more understanding. They know that you help them, they are very happy. Sometimes it's our... Some of the admin staff – they think that they're higher because they can command you. ...they think that they have some power; someone behind them.

Similarly, ex-Tech Mark was asked about difficult people:

Okay, one of the bad people I would put... I won't name her, but I would put a secretary. ... even though I have deep respect for them, sometimes I felt they would push. ... there are some secretaries that want IT to do their job and I hate that and I tell you that it's not fair.

Tech Paul also mentioned this – again in the context of a discussion that began about teachers:

Researcher: I'm trying to find out why relationships are the way they are.

Paul: Good teachers or good staff?

Researcher: People that you'd really rather NOT have to go help?

Paul: (laugh) Teaching staff or non-teaching staff?

Researcher: Let's talk about that. Is there a difference?

Paul: Actually yes. For example in the finance department, yeah. Those are the nasty staff.

Teacher Steve also noticed this: "To be honest, in terms of positions ... I mean from secretaries to EAs to teachers to administrators that I've seen act terribly towards IT support guys."

There is a logic inherent in this: teachers at international private schools might be hired with the expectation that they are culturally sensitive and tolerant. With student populations from many different countries, sensitivity may be a requirement for such teachers – particularly in schools with strong multicultural values. Secretarial staff might be hired without that tolerance as an expectation.

A further supposition might be made that, as professionals or quasi-professionals, both occupations groups generally offer each other a level of professional courtesy.

If you think it's simple, then you have misunderstood the problem.

Bjarne Stroustrup

Chapter 6. Discussion of Findings with Respect to The Literature

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The previous two chapters presented key findings of this study related most clearly and directly to the question: "How do teachers and IT workers at an international private school in Singapore perceive their relationships?" Background issues of professional status, occupational prestige, and occupational culture were covered in Chapter 4; factors relating to perceptions of relationships were covered in Chapter 5.

This chapter will be structured to parallel chapter 2, presenting a review these findings in brief, relating them to the literature with an emphasis upon areas of congruence and difference.

6.1 Professional Status of Teachers

Professional status was a concept that nearly all participants were able to discuss without clarification. If teachers do indeed "...harbour a desire for society to recognise them as members of a profession" (Inlow 1956: 257), then that desire is now fulfilled – at least in part. There was a common conception among participants from both occupations that teachers *did* enjoy a professional status, but that – as a relative concept – theirs was among the "lesser professions". Teaching was consistently ranked below the "classical" professions of medicine and law.

As for the subservience of teaching to national goals, Bluesburg and other international private schools may present an interesting case. In contrast to schools with clear national affiliations, Bluesburg – in its organisational charter – adheres to an ethos of

global peace and intercultural unity. However, exchanging a national “master” for a global one does not necessarily obviate the charge that schools serve an abstract social master. Hence the positions of Nasaw (1979), Herbst (2002), Smolentseva (2003), and Johnson (1982) still hold relevance at Bluesburg. Herbst asserts that 19th century education in the United States and Prussia was influenced by “philosophers, statesmen, authors, and politicians”; Bluesburg includes among its sponsors numerous politicians and philosophers; it was created specifically in an attempt to avert political discord.

Connelly and Rosenberg (2003) assert the following characteristics of teaching and social work:

| Characteristic | Present in Teaching |
|-----------------------------|----------------------------|
| Complexity of work: | no |
| Lengthy induction period: | no |
| Ongoing growth: | yes |
| Specialisation & expertise: | no |
| Authority over own actions: | no |
| Relatively high salaries: | no |

This analysis does not fit the situation at Bluesburg. With complex assessment criteria, externally-moderated work, and strict curricula, the work might be considered complex. There is specialisation and expertise: once trained to teach a specific grade level and subject, large-scale moves to different ages and subjects are not easy. There is also a form of functional autonomy. (Hargreaves (1994) notes the isolation of teachers).

Salaries are a more complex matter. A teacher at Bluesburg with a decade of teaching experience will nearly double the national average salary in Singapore (Singapore MoM 2010). However, teachers also receive a housing subsidy worth more than €1000 per month and their children – if any – are exempted from school fees, amounting to a further benefit of €1000 per month. Although this places teachers more than double the average national salary in Singapore, it is not known – and remains beyond the scope of this study – to gauge this salary relative to that of the ‘average’ family sending a student to Bluesburg.

6.2 Professional Status of IT Workers

The literature regarding the professional status of IT workers has been observed as ambiguous. A corresponding level of ambiguity was found among research participants. Chase's (2008) observation that IT workers must constantly retrain was validated by all members of the IT Support Department, noting that nearly half their time was spent learning new material.

Benamati and Lederer's (2001) views can be correlated with IT Manager Walter's observation that *some* of the IT workers might qualify as professionals. Walter singled out Tech Graham, Tech Eric, Tech John, and ex-Tech Mark as possibly having claim to professional status, while Techs Paul and Brent did not. The IT workers nominated by Walter carry out some of the tasks in Benamati and Lederer's list, while Brent and John do not. Notwithstanding the continuous retraining requirement, the educational achievement of Walter's two levels are also congruent: Techs Brent and Paul do not hold post-secondary degrees.

A further issue lies in autonomy: low-level technical staff are tasked with comparatively straightforward repair jobs, while upper-level workers engage in more complex tasks that require a greater degree of professional judgement. These higher-level IT workers are managers of school-wide resources that might be classified as "mission critical", so they are expected to manifest a high level of personal ethics: it is by choice rather than technical restraint that they maintain the integrity of these systems.

In light of the literature, then, it may be concluded that some of Bluesburg's IT workers might qualify for the professional mantle, though lower-level employees do not.

6.3 Occupational Prestige of Teaching

The relatively low level of occupational prestige of teaching was carried over – to some degree – to teachers at Bluesburg. As with relative levels of professional status, there are at least two dimensions to occupational prestige: the prestige among members of the school community, and prestige in the national social context.

Members of both occupational groups (though not *all* members) mentioned that some degree of prestige was gained by working at Bluesburg. Insofar as it is an elite international private school, there may be a parallel to findings by Nakao & Treas (1994) and

Tinsley & Hardy (2003) that prestige increased with the age level of students being taught. Rather than simple age level, however, it is possible that the prestige is inherited through the *exclusivity* of the educational organisation.

The national context of the research was not an element of the literature review, but clearly affected perceptions of participants. However, these perceptions were inconsistent: while several expatriate teachers noted very positive traditional Asian respect for teachers in opposition to conditions in their native countries, one teacher noted that this traditional respect was fading in Singapore, and another noted that respect in his home country was improving. Among IT workers, perceptions of the occupational prestige of teaching were rarely voiced, though Tech John noted that teachers in local schools probably enjoyed less prestige than those at Bluesburg because the local teachers were more rigidly controlled.

The financial element of prestige – articulated by Duncan & Reiss (1961), Nakao & Treas (1994) and Ganzeboom & Treimann (1996) is another important aspect of teachers' prestige. Like the other aspects, financial implications drive teachers' prestige at Bluesburg toward opposite directions. Insofar as Bluesburg teachers earn far more than the average Singapore salary (Singapore MoM 2010), salary increases the occupational prestige of teachers at that school *relative* to the country and *relative* to IT workers. However, in the context of families whose children attend Bluesburg, the relative position is less clear. Teacher Betty noted that the parents at Bluesburg were likely to be quite wealthy.

Lortie's observation concerning the flat salary structure of teaching is also complicated by the international private school context, particularly in a school such as Bluesburg. As one of three elite schools in a country with a high cost of living, Bluesburg offers a compelling compensation package to lure desirable teachers from other countries – and from other schools in Singapore. In light of the high mobility associated with international career teachers and within the realm of global international private schools, Bluesburg might be regarded as a career zenith of the type that Lortie claims does not exist for teaching.

6.4 Occupational Prestige of IT Workers

The link between occupational prestige and income automatically reduces the occupational prestige of IT workers in both the school and the national social context. The

names of famous IT billionaires were known to IT workers – Paul mentioned that he was in the “same tree” as them, but that they served a different scope. Graham mentioned Larry Ellison (of Oracle) as well, but both these references were made without a sense of kinship.

Relative to teachers and Singapore society in general, the IT workers could not be said to be well off. IT Manager Walter provided information that showed their salaries to be below the national average (Singapore MoM 2010). As such, there was no inherited prestige related to the philanthropy of billionaires. Although IT workers were certainly appreciated by teachers, there was little sense of a prestigious occupation.

6.5 Occupational Culture of Teachers: Isolation, Collaboration & Collegiality, and Balkanisation

Waller (1961: 161) observed that teachers’ “attempt to escape from the stereotype may itself become ... one of the important determinants of the occupational type proper.” This was precisely mirrored in Teacher Greg’s observation regarding being fitted for his “tweed jacket”.

Isolation, Collaboration, and Collegiality: Hargreaves’ (1994) four forms of teacher culture were all observed in the field. Teacher Wanda reported concern for Shawn’s isolation from the rest of the academic computing department, while Teacher Jane specifically chose to locate her desk within social reach of her department. Shawn himself regretted being isolated from his colleagues, while Teacher Greg felt that isolation was a nice *refuge*, rather than being a permanent state of affairs.

Although the teacher’s work still occurs behind the closed door of the classroom, the evidence from these teachers suggests less isolation and a greater sense of collaboration than indicated by Waller and Hargreaves.

Balkanisation: As suggested in the literature review, balkanisation still occurs within the context of the school: teachers and IT workers do not readily socialise. However, Bluesburg is notable in that *some* level of inter-occupational contact is engendered by the collocation of the IT support workers and Computing Department teachers. IT Manager Walter’s dream of putting the IT workers into the same office as teaching faculty is also notable in that it marks a deliberated attempt to put the two occupational groups together.

6.6 Occupational Culture of IT Workers

In observation as well as quotation, it was found that the literature concerning the occupational culture of IT workers was largely validated. Duliba & Baroudi's suggestion that there was no culture is belied by the evidence.

Nearly all participants were able to comment upon “nerd” and “geek” stereotypes. The shades of meaning attached to the latter term in particular approach the denotation that Raymond (2010) attaches to ‘hacker’ in *The Jargon File*. Guzman et al (2004a) and Stanton (2006) identify six manifestations of occupational community. These are cross-referenced with research findings in Table 6.1:

Table 6.1: Dimensions of IT occupational culture found in this research

| Group dimension | Research Findings |
|--|---|
| Esoteric knowledge and expertise | observed and quoted by both occupations |
| Extreme and unusual demands | strongly quoted by both occupations |
| Consciousness of kind | observed and quoted by both occupations |
| Pervasiveness | not observed; marginally quoted |
| Status, favorable self-image | not observed or quoted |
| Abundance of cultural forms (stereotypes, language, stories) | observed and extensively quoted by both occupations |

6.7 IT Workers' Gift Culture and Metacognition

Raymond's (2010) concept of the “gift culture” in IT, exploitation, and the story of the kicked chair are subtly related to each other.

If IT workers harbour a desire for friendship and social contact with others, yet find these efforts thwarted by the ineluctable complexity of conventional social behaviour, then they may adopt unconventional means to establish and maintain those relationships: they *give away* their services beyond the requirements of their contracts *and* against the admonitions of their supervisors (Network Manager Graham and IT Manager Walter).

A task that is clearly beyond the scope of the contracted job is subject to interpretation by the IT worker: if it can be seen as a *request* whose granting is an act of kindness, then

the IT worker can make a gift of it; if the task is a *demand*, then the IT worker is likely to regard the situation as exploitative.

Sacks' (1995) description of Temple Grandin "solving" people rather than "understanding" them is similar to Tech Mark's comment regarding the need to "preprocess" a difficult teacher. "Preprocessing" is a very specific technical term in computer programming, which was Mark's field of post-secondary study. By using that particular term, Mark may be revealing that he sees himself – at some conscious or unconscious level – as a programmable device. Hofstede's (1980) "stable mental program" is that Mark sees himself as a mutable mental program. In his mind, he constructs a filter through which the teacher's interaction are processed before he reacts to them. The metacognitive implications of this may be more important than the mechanism – or the syntax.

6.8 Gender Issues

Gender played no part in sampling, and genders were assigned to research participants largely at random in order to preserve anonymity: relative numbers of male and female participants in both occupations were maintained.

IT workers were predominantly male; teachers manifested a slightly female dominance (7 female vs. 5 male). This is largely consistent with research findings, particularly in the realm of technology workers. Insofar as most teachers were drawn from the ranks of middle- and upper schools, the nearly-equal number of male teachers is unsurprising, approaching the same proportions reported in American secondary private schools (US NCES 2007).

Among IT workers, the specific campus of the school where the research occurred, there were five males and one female. Including the IT Manager and two IT workers at a satellite campus, the proportions are 7 male; 2 female: yielding percentages of 78% male and 22% female – nearly identical to the 79/21 division found throughout the research.

It was not clear that either of these congruent distributions of gender had a marked impact upon either occupational group or the relationships between them. Teacher Jane came closest when she asserted that women were better at communicating.

Teacher Alice's observation that 'helpful students' who attempted to fix things in class were always male is also noteworthy, insofar as these students – already manifesting an interest in fixing technologies – may be "proto-IT workers".

6.9 The International Private School Context

In Chapter 2, the international private school context was explicitly identified as potentially limiting the applicability of existing research to the current study. It was argued that commonly-regarded texts on teacher culture such as those from Waller (1961), D.H. Hargreaves (1980), and Lortie (2002) might not apply perfectly to the “wide variation” (Hayden 2006) of situations found in international private schools.

That same caution applies to the findings in this research. The complex segmentation of the labour market described by Canterford (2003) clearly exists within the Bluesburg organisation. The non-profit, philosophically-oriented nature of the school was mentioned by several research participants, echoing Garton’s (2000) observations regarding effective hiring practices.

While this research showed some congruence with certain precedents, it is also possible that a similar study undertaken at a different international private school might reveal very different relationships. It is far more likely, however, that similar axial themes will arise. Although the relationships may be better or worse, it is expected that the dimensions of those relationships will be similar to those found in this study.

Everybody's got a plan until they get punched in the head.
attributed to American boxer Joe Louis (undated)

Chapter 7. Limitations, Recommendations, and Conclusion

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7.1 Limitations of the Research

7.1.1 The Need to Limit Axial Themes

The strengths and weaknesses of this study are inextricably linked. Within the confines of a single research project, a single researcher, and a strict word count, it is not possible to tell a 'complete' story of relationships between teachers and IT workers – even within a the context of a single school. As originally conceived, this project would have examined relationships at two different international private schools in Singapore. However, it took 18 interviews before the story at Bluesburg could even begin to be considered 'coherent'.

The telling of that story has consumed the whole of this thesis, and yet only a fraction of the full story has been told. Participants spoke of communication problems, the complexities of relationships, and the way that teachers approached technology. Any one of these axial categories could have dominated the study, excluding other themes.

The choices of axial categories to discuss was driven by two imperatives. First, the research questions deserved to be answered as thoroughly as possible, and second, the voices of participants needed to be heard. For this reason, findings were divided into two chapters with slightly different foci and structures. In so doing, depth was sacrificed to achieve breadth.

This approach has omitted some rich detail. Nearly all participants offered stories about their interactions with the other occupation. Even participants who manifested consistently curt answers could suddenly launch into lengthy tales about some past incident. The Kicked Chair was one of these stories, chosen because it was mentioned by numerous participants. The other stories could have been included as well, but establishing theoretical constructs around each of them would – again – have pushed all other results out of the bounds of the word count.

7.1.2 Saturation, Variation, and Transferability

It is not certain that I achieved saturation or even maximum variation. Axial categories were certainly well populated, and a large variation in views was observed. However, it would require more experience to assert, with confidence, that either condition had been satisfied.

Adding a second site to the study might have achieved greater transferability of results, and might have provided a broader baseline against which to measure saturation. It is not clear, at this point, whether such a strategy would have resulted in greater depth or greater breadth in the study. There still would have been a wealth of themes from which to choose, and the depth could only have been pursued by omitting large swathes of material that participants found meaningful.

However, the elucidation of numerous themes in this study might provide readers with a greater opportunity to discover professionally meaningful loci of relevance.

7.1.3 Absence of Theory

No theory was developed from the data collected. This is due to the broadly exploratory nature of the study. Certain themes lend themselves to further inspection, with the possibility that additional probes and more participants might saturate tightly-focused axial categories to the point that a single cohesive theory might emerge from the data.

The temptation to develop a theory remained throughout the analysis and writing-up processes, and it was only nearly the end of these steps that the decision was made to *not* pursue a theory. This decision was motivated by the understanding that the development of a theory would necessarily limit the breadth of the report.

In the absence of clearly precedent work, I chose to provide a broad context for subsequent research. Subsequent sections on “Recommendations” and “Directions for Future Study” include suggestions for future studies that – with this work as a form of

grounding – might feature narrower foci and result in the generation of theories.

7.1.4 Links to the Literature

It was observed, in Chapter 2, that the literature in this field – and those related to it – was regrettably scarce. As a result, the net was broadly cast to find foundations for this study. This foundation was largely valid, and proved useful in developing an understanding of the field prior to the start of fieldwork. The structure of Chapter 4 was dictated by the specific research questions, which emerged directly from the literature; the bulk of Chapter 6 relates this study's findings back to the literature.

Chapter 5, however, demonstrates a problem: a substantial number of findings in this study – findings that emerged from research participants themselves – were not adequately anticipated in the literature.

It is even possible that some of the literature that *does* exist and has been cited is deeply flawed and may be proven wrong. This is a particular risk insofar as much of the literature upon which this study is based is comparatively new. Though this young 'average age' of research contributes to its timeliness, it also raises the risk that the assertions in that literature have not stood the test of time. Whereas Waller, Lortie, and Hargreaves may be old enough to qualify as 'canonical', most of the literature about IT workers was written in the past decade. The most notable exception is *The Jargon File*, which is nearly four decades old and wildly unacademic.

7.2 Recommendations

Although relationships between teachers and IT workers were generally considered to be acceptable by participants, and although the research revealed few areas of serious contention, a number of recommendations emerge from this study. Some of these are applicable at Bluesburg; most of them are applicable to a far wider range of institutions. In some respects, Bluesburg's successes provide a laudable example for other schools.

7.2.1 Communication

Exploitation, difficult teachers, and difficult IT workers are all manifestations of difficulties in inter-occupational communication. Teachers may not be aware of the limits of the requests that they should be making; IT workers are not communicating to teachers that some of their requests are beyond such limits, preferring instead to accede to these requests rather than asserting themselves. For their part, IT workers are not clear in communicating their ethical positions – evidenced by most teachers' lack of awareness of the need for IT workers to maintain those positions.

The fact that most irritants could be resolved by improved communication *from the IT workers* supports the validity of the view that men (and IT workers, specifically) may be lacking in communication skills, with a further barrier caused by national cultures. Language skills were rarely mentioned as a barrier to communication.

It is particularly in this respect that bridgers and tweeners should be employed. If they can consciously adopt the “interlocutor” role, then they can ensure that the messages sent from IT workers – however subtle – are clearly conveyed to teachers. Communications from teachers *to* IT workers – such as Marcia's dismay over IT workers' behaviour with respect to her infected laptop – might also be amplified.

7.2.2 Geography

It has been noted by participants that the desks of IT workers tend toward an appearance of chaos. This probably has the effect of administrators moving the IT workers to a location far from the casual eyes of campus visitors and disapproving administrators. A remote office location might also be assigned to IT workers for other reasons. They are an emerging (and steadily) growing presence on campus, so office space in central – and presumably preferred – locations will be scarce, having already been occupied by higher-status school employees.

However, this exile exacerbates problems with inter-occupational communications and relationships. Casual conversations become possible only when the IT workers are in transit – usually to or from a service call. If the IT workers and teachers are expected to keep different (or more formally articulated) office hours, then even meetings at the beginning or end of the day will be thwarted. Positive relationships are extremely unlikely to be formed when the only contact between the occupational groups occurs at times of crisis.

By placing teachers and IT workers in close proximity, school planners and administrators can increase opportunities for chance meetings and informal contacts that might reduce the barriers between the occupations. If those barriers can be lowered, then meetings between the two groups will not occur only during times of crisis: there will be a stronger social foundation to buffer the stresses invariably caused during equipment failures.

Physical accessibility of IT workers might have an additional benefit in the swifter detection and remediation of problems, perhaps preventing small problems from escalating. Teacher Wanda noted that her physical proximity to the IT workers meant that she could simply tell them about a problem rather than making a call or filing a report – and this allowed her to return more quickly to the task of teaching students.

7.2.3 Tactical Disjuncture

Beyond issues of interpersonal relationships, the proximity of teachers and IT workers might be a factor in a more professional problem. Notwithstanding the efforts of bridgers and tweeners, interactions between the occupational groups are limited to the reporting and remediation of technical problems. This effectively constrains each group to a set of formal scripts: the teacher reports the problem by way of specified communication channels; the IT worker engages the teacher just enough to ascertain the precise nature of the problem; after resolving the problem, the IT worker might attempt to communicate some details of the repair to the teacher – a process which depends upon both parties having enough time and interest to engage in such communication.

At this point, we return to Tech Graham's note that he sometimes like to "go down to the science classrooms, standing there looking at the teachers teaching the students." He goes on to say that he gleans ideas for how to support the teachers, but something equally important *does not* occur: there is no dialogue between the two occupations. The teachers do not ask Graham about technologies that they might like *immediately following the lesson*, and Graham does not offer insights as to how technology might transform the next lesson – again, immediately following what he has observed.

In the absence of this type of communication, a disjuncture emerges between the two occupational groups. Using definitions from Post & Anderson (2000), it is clear that their *operational* goals are identical at the point of repair: the teacher wants a working computer, and the IT worker is effecting the repair. The *strategic* goals of both individu-

als is also presumably the same, insofar as both are members of an organisation with a mission. It is on the *tactical* level that a disjuncture emerges: the teacher does not care how that particular computer is related to other school technologies, and the IT worker does not care what the teacher does with the computer as soon as it's working again.

This tactical disjuncture leaves both occupations starved of context; neither side can benefit from the insights of the other. Teachers would better be able to articulate their teaching goals, while IT personnel would be in a position to offer suggestions as to the technologies that teachers might employ to reach those objectives. Instead of merely fixing a specific problem, members of both occupations could take a step back from the immediate issue and – together – ask, “What are we trying to accomplish?”

This disjuncture can be bridged through the efforts of technology committees and IT Directors, but increasing formality in roles and processes may reduce the opportunity of *ad hoc* communication. Inter-occupational collaboration *at the point of need* is likely to be relevant and effective. Even disagreement can be a productive force in this relationship, insofar as challenges over the *method* of the solution can serve to generate superior solutions (Jehn et al 1997).

7.2.4 Bridgers and Tweeners

The discovery and distinction of bridgers and tweeners is a key finding with implications for all schools that have in-house IT support departments. Both types of individuals are likely to exist already in schools, and the manner in which they are treated by managers and principals may have a large impact upon the school's technology profile. By the accounts of both occupational groups, they are a scarce resource that should be highly valued and developed. The literature is rife with evidence that the two occupational groups are diametrically different; employees who are able to reach across this divide may be uniquely helpful to their institutions.

Bridgers are staff members – from either occupational group – that are *not* in a position where they are required to engage the other occupational group, but choose to do so for any of several reasons. They may be inherently interested in the other occupation (such as Betty) or they may be deeply empathetic (such as Jane). Perhaps, like Mark, they view their occupational counterparts as a problem worth solving. Like Wanda and Shawn, they may be occupational hybrids that find their place by living in both worlds at the same time. The Bridgers are motivated not by their contracts, but rather by an inherent interest – perhaps a *need* – to exist in two different places at the same time.

School directors should not waste these rare resources, and instead make allowances – both before and during employment – that make the most of these unusual talents¹.

Other than Betty, none of the Teacher Bridgers in this study was a lifelong teacher. All had worked for some time in industry – either as technicians themselves (Shawn) or within industry performing some type of technology-related task (Jane & Wanda). The Bridgers *all* forged strong relationships with their occupational counterparts, leading – arguably – to a more effective cooperation between technology support and the delivery of academic curriculum. Conflict still occurred, but it was regarded by all concerned as a productive variety of conflict – the Kicked Chair being a cogent counterpoint.

When hiring such individuals, school managers would do well *not* to discount non-teaching experience. Particularly in the context of an individual working in a technology-related academic field, the experience of having worked outside the academic environment might *improve* that individual's ability to perceive problems in a holistic manner. And by being able to relate to the 'inside' occupational culture of IT workers at the school, the 'former tech worker' who is a teacher is likely to forge more effective bonds with those workers.

Locating the bridgers in any school is quite simple: they quickly gain reputations for having the answers to technical questions. They have gadgets, they regularly chat with the IT workers, and they can be found agitating for the adoption of new or alternate technologies. It is possible that social deficits may counterbalance their usefulness and reduce their popularity – requiring insight from HR personnel to recognise their benefits and manage them effectively.

Tweeners, by contrast, are those individuals whose formal work positions explicitly place them at the intersection of technology and teaching. IT Manager Walter was clearly a member of this group; Shawn and Wanda might be considered 'near-tweeners'.

From the perspective of upper-level managers, it appears reasonable to seek candidates for 'tweener' positions among the ranks of existing, informal 'bridgers'. It is possible that the available bridgers are too limited in key respects for tweener positions, but bridgers might be an excellent starting point in searching for a tweener. It is also possible that bridgers are most useful precisely where they are – as *informal* links between curriculum and technology.

¹ Regrettably, polymathism and neurodiversity are both beyond the scope of this paper.

As with bridgers, the hiring and management of tweeners may be complicated by neurodiversity. This does not invalidate neurodiverse candidates, nor does it automatically augur their failure. However, some level of managerial adaptation may be required for such individuals to excel in their roles. Tweeners may benefit from having had experience as workers or managers in *both* industry and academe. Unfortunately for those responsible for hiring, both tweeners and bridgers in schools require accomplishment in fields characterised by diametrically opposite profiles.

7.3 Directions for Future Study

Although this study was complete – existing as a coherent, internally consistent entity – it suggests some obvious directions for future study. Some of these issues are plausible extensions to the foundation that has been laid; other directions are more speculative, but no less prompted by this research.

- Regarding tactical disjuncture: how does information flow between teachers and IT workers? How does each side learn about the needs and opportunities of the other? How do members of either occupational group respond to different types of communications from others?
- What are perceptions of relationships between IT workers and different occupations with the school (private or otherwise)?
- What are the dynamics of local vs. expatriate employees at international private schools? Where (if any) are the tensions? Do cross-national relationships develop, and how? If those boundaries are ever crossed, how is this done, and under what conditions by which individuals?
- Follow-up to this study at domestic public schools.
- Follow-up to this study, with foci upon Communication, Relationships, & Teacher Approaches to Technology. These were three common axial themes that were not included in the current study. The third topic can be studied without reference to relationships between occupational cultures.
- Longitudinal study: What happens to bridgers and tweeners across 3, 5, and 10-year horizons?

- Other inter-occupational frictions in the international school environment. How do secretaries (admin staff) feel about teachers and IT workers? Are there other combinations of occupational subgroups that manifest notably good or bad relationships? Do tweeners and bridgers exist among other occupational groups?
- Why do IT workers manifest the ethics they do? Is it related to Baron-Cohen's (2002) neurodiversity and the psychosocial findings of Gabbeta and Hertog? (2009)

7.4 Conclusion

All the evidence collected in this study has shown that teachers and IT workers in the research site enjoy generally positive relationships. Tensions exist, but they are not as deep as expected, given the differences between occupational practitioners. The supposition has been advanced that this amicability is due to professional courtesy coupled with an expectation of cultural tolerance articulated through hiring practices at Bluesburg.

It has been established that IT workers are subject to occasional exploitation from other members of the school community, but teachers are not the only source of this behaviour. Teachers at Bluesburg are generally happy with the quality of service they receive from their IT workers.

Notwithstanding Collinson's (2006) work on administrative staff in universities, this study presents a first glimpse of a heretofore unknown landscape. From international private schools to inter-occupational relationships; from neurodiversity and gender to perceptions of professionalism and intercultural communications, it has been necessary to integrate numerous disparate concepts to frame the situation under study.

The specific research questions have been answered; in the process of answering the main research question, some important themes have emerged that were not predicted in the literature review. In presenting these themes as an interwoven fabric, some degree of depth has been sacrificed; the nascence of the work and its subject are offered as a counterpoint. An examination of a specific sub-theme would miss the greater point: a new locus has been discovered, and some of its characteristics described.

Having begun this analytic task, a foundation for future studies has been established.

“You are either very brave or very foolish.”

A professor at a university, after learning about this research project

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