

CHAPTER TWO

Capacity and Competence

This book hammers three themes. They are:

- 1 State schools do not have the capacity to lift Maori student achievement to the level required.
- 2 All levels of the existing state schooling sector – teachers, principals, boards, Ministry, ERO – protect the incompetents within it, and those incompetents are concentrated in schools with a high Maori roll.
- 3 Many schools abuse their Maori pupils.

This chapter deals with the distinct but related concepts of capacity and competence. The two words are used in this book with a precise, technical meaning. Capacity is a question of fact. There is no judgement attached. Capacity means the highest level of output a system produces. Competence is an objective judgement as to whether measurable standards have been met. The terms are used in quite different contexts. Quality managers talk about capacity when they are aiming to reduce variation in performance. They talk about competence (or fitness to standard) when they are aiming to improve the average performance. The two concepts are related by their common use as instruments to achieve consistent, high-level performance. Consistent, high-level performance is another way of saying 'quality'.

Consider two cricket batsmen. Cricket is a game that is won by the

team with the most runs. Batsmen score runs. The table shows the runs scored by Hone and John in each of their last ten turns at bat.

Hone	0	4	8	105	4	3	7	103	0	6
John	20	16	32	24	22	28	18	30	22	28

On average, both players score the same number of runs (twenty-four) each time they go out to bat. However they are very different batsmen. Hone has the capacity to score 100 runs; John does not. It is quite possible, though, that John is technically the better batsman, and that, depending on the test of competence (preparation, stance, shot selection, shot execution), John may be judged competent and Hone non-competent.

From an engineering or quality-management perspective, capacity is about determining the extreme performance. How many widgets can this factory produce in a day? The reason for asking this question is that it leads to a second question – how can we make the extreme performance the normal, and then the average, performance?

This second question is a question about reducing variation. In the context of this discussion, variation is of two main types, ‘common cause’ or ‘special cause’.

Common cause variation is the overall effect of the ordinary day-to-day factors that influence performance or output. Rangi catches the bus to work every day. Sometimes the bus is on time, sometimes the bus is a minute or two early, sometimes it is a minute or two late. These differences are the result of common causes of variation – the bus doesn’t leave the depot at the same time every day, things are a bit slower on wet days, sometimes every traffic light is green, sometimes there is a greater or lesser number of passengers who are slow to get on the bus and seated. In general terms, common causes of variation have a small individual effect on performance and the individual effects can either add to, or cancel out, the effects of other common causes on the day.

Occasionally, though, something out of the ordinary happens – there is a new driver, or the bus breaks down, or there is a power cut in the city so traffic to town is minimal – and this has a large effect on performance.

The bus is very late or very early. These are special causes of variation.

A process with only common-cause variation is stable or predictable, in the sense that there are performance limits that hold true 95 per cent of the time: for example, John gets between sixteen and thirty-two runs every time he bats.

A process with both common and special causes of variation seems unpredictable. Although Hone gets fewer than ten runs 80 per cent of the time, every now and then he is brilliant. The presence of special causes of variation excites quality managers and CEOs because of the prospect of either making the extreme performance the norm, or eliminating the extreme performance, depending on where the profits lie, without the need to re-tool the system. That is, special causes of variation suggest increased profitability without the need for expensive capital investment.

In Hone's case, the coach or quality manager would investigate the reasons for the early dismissals. It might be that Hone cannot resist the ball of drivable length that pitches on off-stump. He goes for the shot, and when that ball is bowled to him early in his innings the shot is mistimed or miscued and offers a catching opportunity to the fielding team. This is a simple solution and after Hone has been trained not to go for the drive early on, his proportion of big scores increases dramatically.

Hone presents an example of the quality cycle in action. An area for improvement is identified. This is normally one where there is a large variation in output. Data are collected and analysed. Causes of variation or poor performance are identified. A solution is conceived and implemented. If successful, the solution is standardised.

Special variation is relevant to New Zealand schools because it does occur. When it occurs it has a large impact on performance. Schools should want to capture some sources of special variation, ensuring they continue to occur. Conversely, schools should want to eliminate other causes of special variation. However, far too many schools, particularly schools with a high Maori roll, do not collect the data necessary to determine if special cause variation is present. If data are collected they are often not analysed and converted into useful information for decision-makers.

The first step is to decide on priorities – what are the key performance indicators for the school? Then collect data. Then analyse the data and present the data and analysis as a report. Finally, relevant considerations must drive management decisions.

Imagine a school that employs Tama as a teacher. Tama's students make dramatically better progress than similar students have done in the past. Their parents remark on how the children's attitude to school and to life in general has changed for the better. Attendance has improved from a level well below the national average to one that is exceptionally high. However, his fellow teachers do not like Tama. He is a first-year teacher and although he is not overtly critical of their classrooms or of them he has refused to change his informal teaching style to one that is 'professional'. The level of background noise in his classroom is too high. The students call him Tama. His class is often out in the playground under a tree during class time on a hot day. He mixes socially with parents, and prefers a pint at the tavern after school on a Friday to the team-building tea and biscuits on offer in the staffroom.

Many Tamas enter the state school teaching system. However, a good number of them do not remain in the system for long. They are recognised as special causes of variation, although that is not the epithet applied to them, and driven from the system. Too often, education managers value conformity and peer acceptance above performance in mission-critical areas.

Special-cause variation is often confused with true randomness (due to the tyranny of small numbers). For example, a school might employ two new teachers for two mixed-level Years 5 to 8 classes. There is no overall effect on attendance or student achievement and the two classes might have had very similar achievement and attendance levels at the beginning of the year. However, all the Year 8 students in Rangi's class pass the entrance maths test administered by the local high school while none of those in Basil's class do. The average pass rate is 50 per cent. It is always 50 per cent plus or minus a few percentage points.

It is easy to see that if both Rangi and Basil each have one Year 8 student, no valid conclusion can be drawn from this sample. Under the

null hypothesis, or starting assumption, that Rangi is an average teacher for this school, there is a 50 per cent chance that his Year 8 student would pass. Similarly, there is a 50 per cent chance that Basil's student would fail. Statisticians will not discard the starting assumption until the observed results are very unlikely. Typically, the threshold for 'very unlikely' is a 5 per cent probability of the observed results occurring under the null hypothesis or starting assumption. Sometimes the threshold is set at 10 per cent or at 1 per cent, depending on specificity (how important it is not to reject the null hypothesis when it is in fact true) and on sensitivity (how important it is to detect an effect if one is present).

The difficulty for a primary school manager is in deciding if, for example, Rangi has seven students out of ten who pass, this is evidence of a special cause operating. The problem is that not many primary school principals have the background in introductory statistics required to calculate the 'p' value in this example. Nor do many have any familiarity with binomial distribution tables. The 'p' value, or probability of this result or a more extreme one (eight, nine or ten students passing) occurring by chance, is actually 0.172. Although it is a good result, it may well have arisen by chance. If eight students had passed, the 'p' value would have been 0.055, which is strongly suggestive of an external cause in operation.

There may be additional factors that a school manager can use to determine whether Rangi is a special cause in terms of student achievement. For example, it may be that Rangi's students have a superior attendance record.

Principals who are interested in detecting special causes could arrange their classes and teachers to enable this to occur. For example, if it is suspected that Rangi is a beneficial special cause with respect to Maori Year 8 students, then the principal could ensure that sufficient Maori Year 8 students are in his class so that the power (i.e. the probability that an effect will be detected if it is present) of the analysis used to evaluate student achievement is 0.8 or more.

So far, this chapter has discussed capacity or the highest level of output a system can produce. We have used a sporting example to illustrate the key point that sometimes output is abnormally large because something

out of the ordinary has happened. Technically, this abnormally good performance is said to be because of special-cause variation. In schools, two sources of special variation are exceptional teachers and exceptional principals. We have said that schools need to have data-collection and analysis systems in place that enable them to detect special-cause variation when it occurs in mission-critical areas; however, many schools do not collect data of the right type and do not have the skills to analyse these data appropriately if they are collected. And we have pointed out the trap of confusing random fluctuation with special-cause variation.

Before moving on to discuss competence, it is important to distinguish capacity and potential. Capacity means the highest level of output a system produces. Potential refers to the highest level of output a system might produce at some unspecified future time. They are very different things.

Our position is that the New Zealand state school system does not have the *capacity* to produce Maori achievement. This requires some definition of Maori student achievement. A simple one is something like: 'Eighty per cent of Maori students have achieved the objectives of Level Two of the English and mathematics curricula by the end of Year 4; the objectives of Level Three of the English, mathematics and science curricula by the end of Year 6; the objectives of Level Four of the curricula by the end of Year 10; and NCEA Level One by the end of Year 11.'

The current performance of the state school system has 30–60 per cent of Maori students achieving at this level. The actual percentage depends on what is being measured and, unfortunately, on who is doing the measurement. Some of the variation in the achievement percentages reflects changes in the measurement standard. For example, Maori pass rates in School Certificate improved in the 1970s and 1980s after the examinations were changed to be less monocultural. Maori students did not know any more as a result of this change, but they got better marks in the exam. Similarly, the progressive watering down of the curriculum over the years, and the dumbing down with the introduction of NCEA, has improved the achievement figures but not the underlying knowledge and learning of Maori students. These changes to the examinations, and the

watering down of the curriculum, are examples of structural variation.

Overall, though, Maori achievement is stable in the New Zealand education system. Thirty to 60 per cent (average 40 per cent) of Maori in Year 11 at mainstream state schools pass NCEA Level One each year. There is some fluctuation in this figure due to common-cause variation and some change due to structural variation. Our point is that the figure is well short of the 80 per cent required, and as no part of the system is achieving at the required level there is no prospect of the existing system performing at the required level. The system does not have the capacity to do so.

This is not to say that the state school system does not have the *potential* for 80 per cent of Maori students to achieve. However, it is to say that the tools the Ministry of Education and the ERO currently use to improve student achievement reflect an ignorance of the problem. The current approach is to inspect schools and suggest areas for improvement. This is the way to capture or remove special causes of variation. It is the way to convert extremely good performance into normal and then average performance. However, there is no extreme (good) performance in the system. The approach cannot work, and has not worked.

The problem with the state school system is that the average level of Maori student achievement is too low. This is not a problem that can be addressed by inspection. This brings us to the topic of competence, or fitness to standard.

Fitness to standard is one approach to quality. Inspection is used to determine whether a product does what its designers intend it to do. The Education Act 1989 describes Parliament's intention with respect to school boards of trustees. It sets standards with respect to meeting frequency, preparation of a school charter, monitoring of student attendance, school finances and so on. Every three years, more frequently in a school with problems, the ERO visits schools and inspects the board of trustees against the manufacturer's specifications as set out in the Education Act 1989.

Similarly, the Teachers' Council has a lengthy description of a satisfactory teacher (see Table 2, 'Teachers' Council description of a

satisfactory teacher') that identifies four dimensions and criteria within each of these.

Inspection of the finished product raises the average quality of product sent to market by removing items that do not meet the manufacturer's standard. However, the New Zealand educational system does not set a standard for Maori student achievement. In consequence, schools, boards and teachers are not inspected for this and are not removed or reworked for not meeting such a standard.

The other great problem with the dated 'fitness to standard' approach to the manufacture of schools, boards, principals and teachers is that the standard is set by Parliament and bureaucrats, not by users of the products (parents) and certainly not by students, the raw material inputted into schools.

Raising the average quality of widgets sent to market by removing those that are below a set standard is clearly an expensive exercise. Equally clearly, it is not an approach that can be used in the education system. If all the defective schools were closed there would not be enough schools left. What is needed is a twofold approach. The average widget quality must be improved, and the variability around that average must be reduced so that few, if any, widgets need to be discarded.

It is not enough to reduce the variability of school performance alone, as the ERO and the Ministry try to do through imposing ever-increasing compliance requirements. Indeed, this is exactly the wrong thing to do. Imagine that a widget must be of minimum weight, say eighty grams. Initially the process used produces widgets of a median (and average) weight of eighty grams, so half of those produced must be discarded. Reducing the variation of this process will not reduce the amount of waste. The median and average are still eighty grams, and so although the discarded widgets will have an average weight closer to eighty grams they will still be thrown out. Overall waste, as measured by the total weight of discarded widgets, will have increased.

If matters are worse than this and the median/average weight of widgets is below the minimum required, as is the case with Maori achievement, then reducing variation will increase the proportion that is discarded.

Table 2: *Teachers' Council description of a satisfactory teacher*

Knowledge <ul style="list-style-type: none"> • Current curricula, the subjects being taught and current learning theory. • The Treaty of Waitangi, te reo and tikanga Maori. • The characteristics and progress of their students. • Appropriate teaching objectives. • Appropriate technology and resources. • Appropriate learning activities, programmes and assessment.
Practice <ul style="list-style-type: none"> • Creates an environment of respect and understanding. • Establishes high expectations which value and promote learning. • Manages student-learning processes. • Manages student behaviour positively. • Establishes a safe physical and emotional environment. • Communicates clearly and accurately in either or both of the official languages of New Zealand. • Uses a range of teaching approaches. • Engages students in learning. • Provides feedback to students and assesses learning. • Demonstrates flexibility and responsiveness.
Relationships <ul style="list-style-type: none"> • Reflects on teaching with a view to improvement. • Maintains accurate records. • Communicates with families, whanau and caregivers. • Contributes to the life of the learning centre. • Develops professionally. • Maintains confidentiality, trust and respect.
Leadership <ul style="list-style-type: none"> • Demonstrates flexibility and adaptability. • Focuses on teaching and learning. • Leads and supports other teachers. • Displays ethical behaviour and responsibility. • Recognises and supports diversity among groups and individuals. • Encourages others and participates in professional development. • Manages resources safely and effectively

In general, there are no cheap answers to improving the average performance of a process (e.g. a school) when the gap between actual and required performance is wide, as it is in the New Zealand school system. Sometimes, when the average performance is close to the required performance the necessary improvement can be obtained by chasing down those common causes of variation which act to decrease the average. (In the bus example, it might be possible to dramatically reduce the number

of times that the bus leaves the depot late.) This is what most authors mean by 'continuous improvement' or kaizen. The idea is that small improvements add up, and sometimes combine or interact to produce a relatively large improvement.

In a factory where the market demand is for heavier widgets or widgets with more features, the answer may be a capital investment in new tools. However, re-tooling is not the answer for the state school sector. Setting aside the matter of expense, it is not known what new tools are needed. New Zealand has no experience of Maori student achievement in the state school sector. There is no pool of high-performing schools with a majority Maori roll doing things that can be standardised and generalised to other schools. The few examples that do exist are the product of exceptional people in exceptional environments. Although exceptional environments may be reproducible, exceptional people are one-offs.

New Zealand needs to find out what works. The way to do this is to focus schools on increasing Maori student achievement while increasing the variability in the current system. Innovative providers of Maori achievement must be encouraged to establish, and those that show promise must be nurtured. Poor providers must be culled. When existing state schools or new providers do demonstrate superior Maori student achievement, it is important to identify the special causes of variation that are operating and to introduce those into second-tier schools.

Any discussion about lifting the average performance in a service sector such as education is, at least in part, a discussion about increasing the level of competence of the people in that system. Competence is an objective judgement as to whether measurable standards have been met. This is understandably a sensitive subject for teachers, principals, boards and schools. No one likes to be told they are incompetent, yet this is exactly what we are saying. Many teachers are lovely people, committed to their jobs and their students. They are hard-working and so on. They are also incompetent, as their students do not reach the required level of achievement.

The concept of cultural competence provides a way into talking about competence. Neither cultural competence nor its close relation cultural

safety has a generally agreed meaning. Both have become associated with political correctness and Treaty rights, and many teachers and school trustees have dismissed the words as just a spearhead through which the politically correct liberal left and radical Maori are trying to gain control of education delivery and make the teacher's job in the classroom even more difficult than it already is.

Many common definitions of cultural competence go something like this: 'a set of academic, experiential and interpersonal skills that allows individuals to increase their understanding and appreciation of cultural differences and similarities within, among, and between groups'. It is unclear from this definition how the various skills in the set should be selected. It is also unclear why it is important for teachers to have this set of skills.

A better way of approaching cultural competence is to see it first of all as one of a number of competencies a teacher, principal, trustee and school should have. Cultural competence is a competence. That is, it is something that can be assessed objectively by reference to standards. Cultural competence is the cover-all phrase that describes the various skills and competencies possessed by those providers that achieve the same educational outcomes for Maori as they do for Pakeha.

Cultural competence is a term that is grounded in the observation from various countries that indigenous people have worse educational outcomes than members of the dominant culture. The proponents of cultural competence argue that this is evidence that Maori receive education of a lower standard. They support this contention by pointing out that our education system is 'by Pakeha for Pakeha'. It is not surprising that it fails Maori as it was never designed for them.

So we can define a culturally competent teacher, principal, board of trustees or school as one that produces the same education outcomes for Maori as it does for members of the dominant culture. (As an aside, a service can be culturally competent but globally incompetent, for example if it produces the same poor outcomes for everybody.) The definition suggests that a set of standards for cultural competence focuses on education outcomes. It also focuses attention on specifics. A school

that compared the reading age of its Maori and Pakeha students might well find that a greater proportion of Maori had a reading age one year or more below their chronological age. A common response would be to blame the Maori (attends less frequently, less well-behaved, no books at home, no parental support, just not as bright). A willingness to reflect on what the teacher or school can do to improve the reading age of Maori students and to change practice to achieve this is central to developing cultural competence. It simply is not good enough for the teacher or school to claim their job is done once they have provided the Maori student with the 'opportunity' to learn. Cultural competence requires the teacher and school to accept responsibility for what they are paid for (especially in the environment of Tomorrow's Schools) – achievement in education for all their students.

The primary barrier to cultural competence is the belief that there are core standards that all schools must meet, and that the brown bits can somehow be tacked onto these. This is a requirement that Maori have a white centre. Depending on whether a crumbly base is required of Maori, it may be described as either the potato or the mallowpuff formulation. An example of this is the practice in many schools of not allowing parents and whanau to come and go from the school and the classroom as they wish. They are seen as visitors and safety risks. We recall being asked to sign a visitor's register for 'fire safety' reasons. There are concerns about estranged parents having access to their children, and about child molesters seizing the opportunity, but let's be honest about it – how many schools like the idea of fat Maori waddling round barefoot looking for the chance to sneak a cigarette? The standards are white. Kura kaupapa Maori and kohanga reo, in contrast, are places where Maori feel comfortable. They are not the ideal, sterile, person-less arrangement of objects one sees in the elite schools. Maori finish up having to justify what works for us with reference to standards that do not work for us, and have never worked for us. This is the major barrier to cultural competence in education.

A second barrier to cultural competence is the racism of educationalists. Sometimes teachers, principals and schools treat Maori differently from how they treat Pakeha. When that different treatment results in a

poorer education outcome, the teacher or school can justifiably be asked whether racism is the cause of the worse outcome. Well-known examples are the lower expectations of Maori students, the lower threshold for reporting Maori families to the truancy service and the lower thresholds for excluding Maori students.

Cultural safety courses are often about examining the personal baggage that teachers cannot avoid taking into the classroom. Teachers have been slow to recognise the influence that their attitudes, beliefs and preference for people like them can have on their decision-making and on the children in their care. Bishop and Glynn (1999) put it like this: 'while many teachers believe they are acting in the best interest of all the children in their care, their understanding of what is best for children is determined within their own Eurocentric world-view which incorporates their own cultural perspectives on epistemology and pedagogy. Hence their actions may be, at best, not meeting the needs of Maori children and, at worst, detrimental to the emotional, spiritual, educational and possibly physical wellbeing of Maori children.'

A third barrier is simple ignorance. This is what most existing and proposed courses in cultural competence address.

A fourth barrier to achieving the same education outcomes for Maori as for Pakeha is cost. In a state education system designed by Pakeha for Pakeha, it costs more to achieve the same outcomes for Maori. This is not surprising. A 'by Pakeha for Pakeha' system will be more efficient at dealing with Pakeha. A useful analogy here is a factory repair line that is tooled up to work on one brand of defective widget. It will almost certainly cost more to repair the occasional widget from another manufacturer that appears on the line. The tools won't quite fit, or something unfamiliar will need closer than normal inspection, or the thing just doesn't respond the same as the 'normal' widget.

Evidence of cultural competence is not difficult to find. There are superficial indicators easily visible to a school visitor. These include cheerful, on-task brown faces in the classroom and brown faces on the staff as well as a school environment that looks and feels Maori-friendly. The response of Maori, both parents and others in the community, to

students do not reach the achievement goals that are part of the 'standard' for teachers.

As we have said before, it is important to realise that teacher competence, like cultural and other competencies, occurs within a context. A teacher who is competent in one context, his or her comfort zone, may be incompetent outside it.
