

The effect of location on the educational attainment of indigenous secondary students in Queensland, Australia



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Abstract

This investigation focuses on indigenous secondary education in both rural and urban areas of the state of Queensland, Australia. The research question of *‘What is the effect of location on the educational attainment of indigenous secondary students in Queensland, Australia’* is primarily concerned with the distribution of educational services, indigenous population distribution and indigenous secondary education attainment. The indigenous population is currently disadvantaged in many areas including education, health, income, housing conditions and employment opportunities. The fact that a high proportion of indigenous Queenslanders live in rural areas and that rural areas contain a smaller number of secondary schools, results in an overall disadvantage in accessing educational services. Twenty-seven government secondary schools responded to an original online survey, which served as primary data whilst secondary data from various sources validated these results. Indigenous secondary students have lower retention rates than non-indigenous students, and their educational attainment also decreases with increasing remoteness. Educational attainment also decreases with age, where Year 8 and Year 10 retention showed little difference over distance compared to Year 12 retention, which decreased with remoteness. The reasons behind this include the concept of a settlement hierarchy, where the number of services and therefore school accessibility decreases with remoteness. The primary data demonstrated that distance to school affecting retention rates shows little correlation with remoteness. That school curriculum lacks relevance to indigenous culture and history, family issues and financial restrictions all became more important reasons behind low retention rates with remoteness. The issue of indigenous education is extremely complex, and there are many social and geographical explanations that could not be explored due to the limited scope of this essay. To fully understand the reasons behind low indigenous educational attainment, Australia’s colonial history and consequent loss of indigenous culture and identity must also be taken into account.

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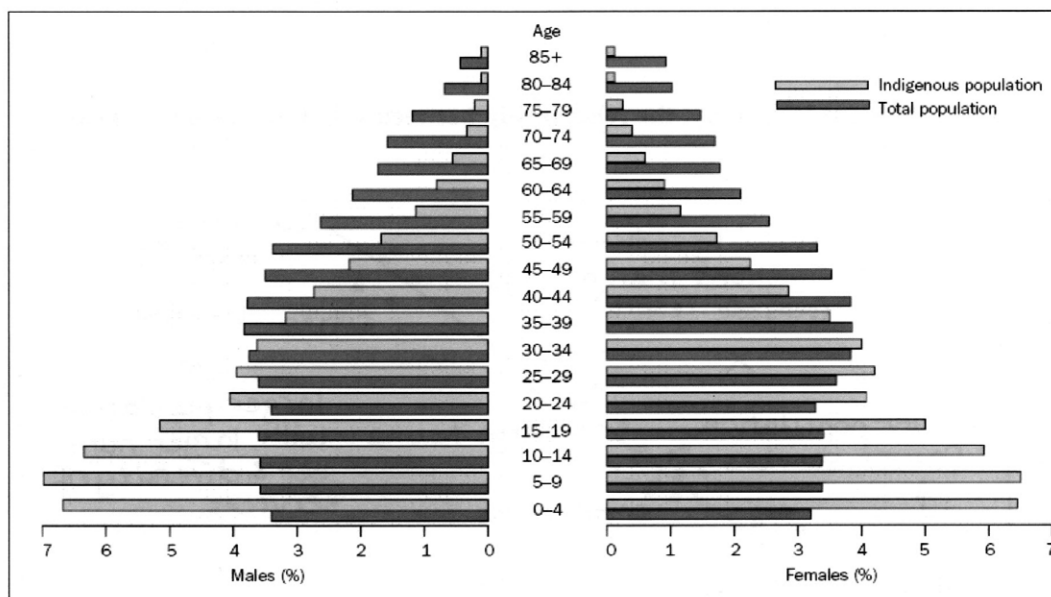
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Introduction

Since European colonisation in 1788, the standard of living of indigenous Australians¹ has consistently been lower than the total population. The Commonwealth Government ‘recognises that Australia’s indigenous people are “the most educationally disadvantaged group in the community”’ (DETYA 1999), though Indigenous people are also disadvantaged in terms of access to health services, employment opportunities and housing conditions; their life expectancy is almost twenty years below the Australian average (Banks 2005). This topic explores the spatial relationship between the indigenous population and the distribution of education services distribution and whether this is a factor in determining secondary education attainment.

As a result of the disadvantages outlined above, the indigenous Australian age-sex population structure resembles a pyramid of a less developed country, contrasting with the more developed total Australian population (Figure 1).

Figure 1: Age Structures of the indigenous and total populations, 2001



Source: Trewin 2003

¹ Of Aboriginal or Torres Strait Islander descent, identified as an Aboriginal or Torres Strait Islander and is accepted as such by the community in which he or she lives, or formally lived (*Proof of Aboriginality* 2006)

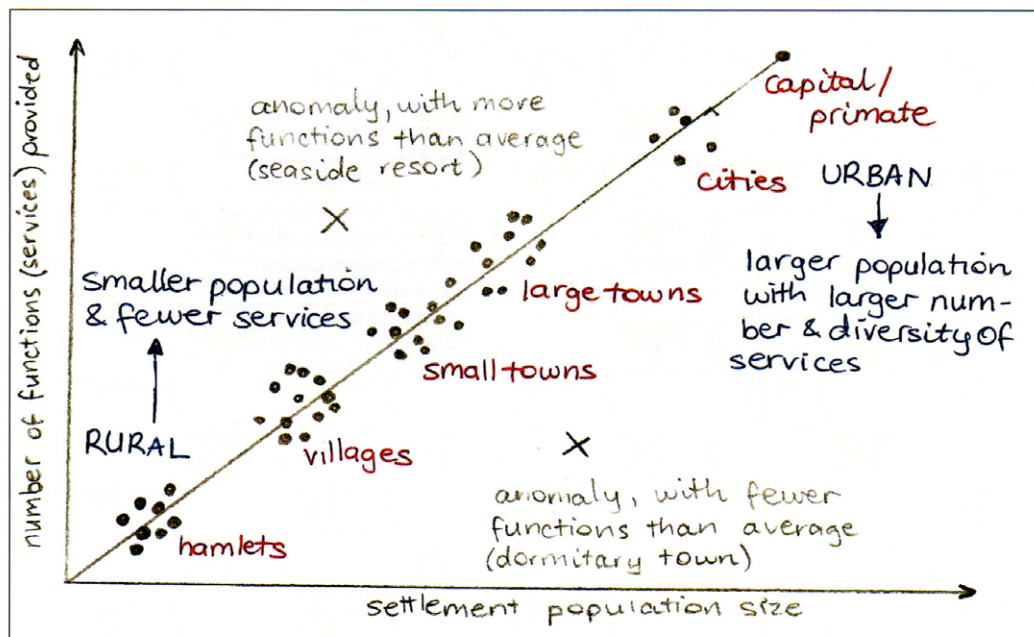
It is widely accepted that educational attainment is linked to improved living conditions through better employment opportunities, increased income and a consequent decrease in birth and death rates for less developed populations. In Australia,

“For most students, compulsory education ends in year 9 or 10. Many of the Indigenous students who elect to leave at this point have poor literacy and numeracy skills. They are, as a result, limited in what their options may be for the future. As stressed by many of the Indigenous people consulted, this all too often leads into boredom, despair, substance abuse, and criminal activity.” (Banks 2005)

Thus, education – especially the continuation of education through secondary school – is vital in improving the standard of living and self-determination of indigenous Australians, especially with such a large current school-aged population.

The indigenous population is also more widely distributed across Australia with a higher proportion living in rural and remote areas than non-indigenous Australians (Figure 2 and 3). According to the concept of distance decay¹, the number of services provided in settlements decreases with increasing distance from urban areas (Waugh 2002). As fewer people live in rural Australia, the concept of a settlement hierarchy can also be applied (Figure 4) to identify the lack of services in rural areas.

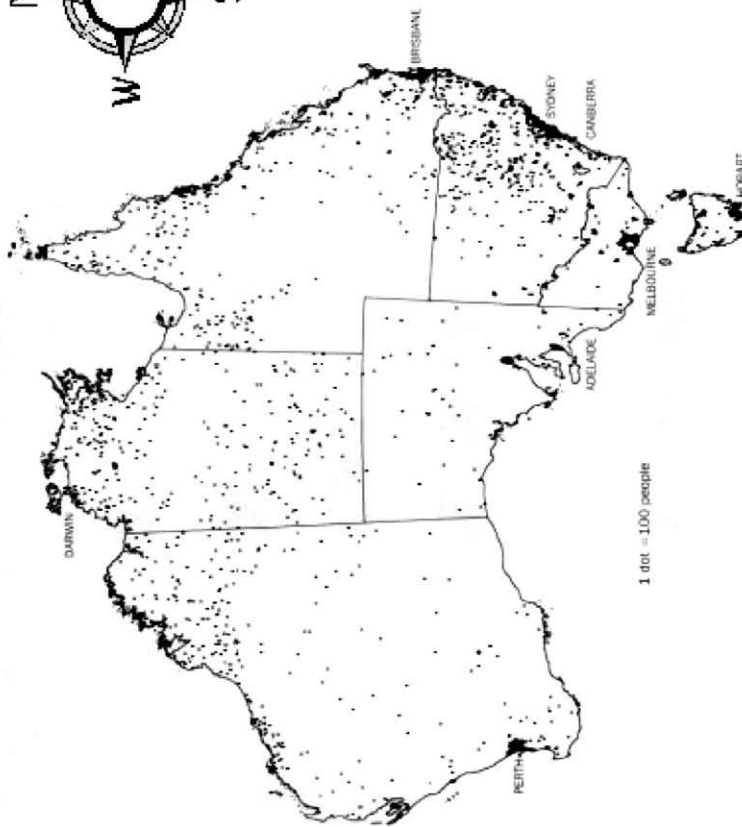
Figure 4: Settlement Hierarchy, the relationship between size, function and rurality



¹ Distance decay is where a factor decreases in force 'with increasing distance from the location of maximum intensity' (Mayhew 1997)

Indigenous versus Non-Indigenous population distribution

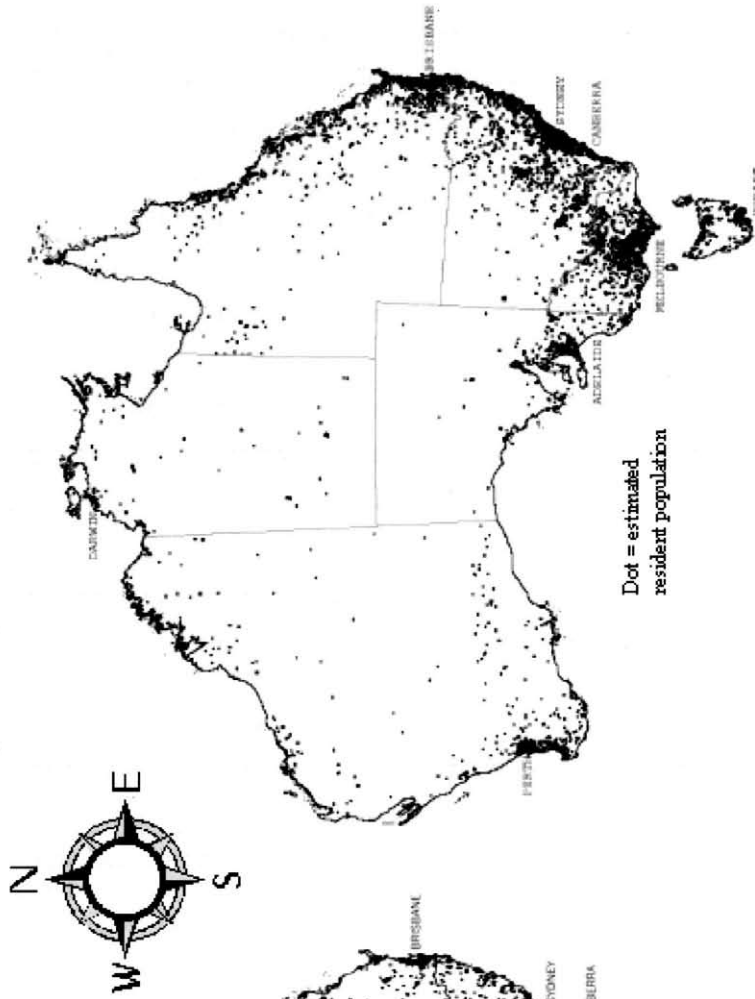
Figure 2: Distribution of the indigenous population, 2001



(a) Represents a random distribution within Statistical Local Area boundaries.

Source: Trewin 2003

Figure 3: Population distribution, Australia, 2000



Source: Population Distribution 2007

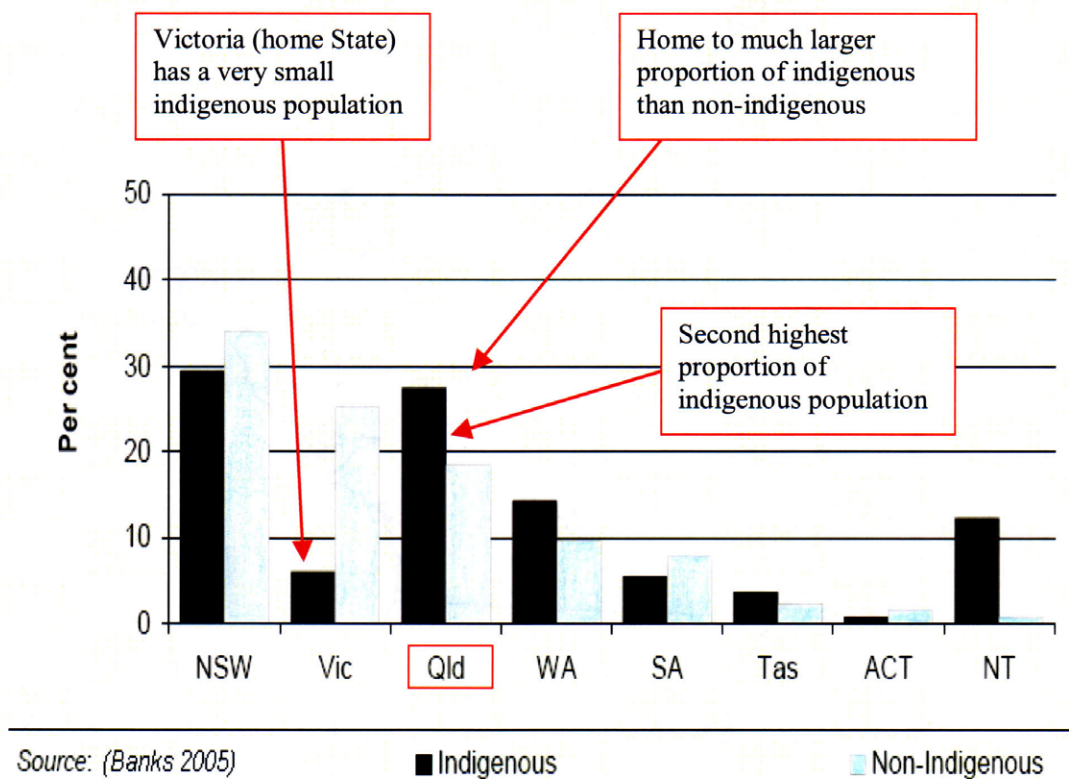
Not to scale

Consequently, as there is a greater chance that indigenous Australians live in rural areas, they will have fewer educational services available to them. According to Biddle, Hunter and Schwab (2004), ‘there is a clear pattern of higher [school] attendance in the urban areas, particularly in the metropolitan regions of capital cities’ and students who live there are more likely to ‘undertake and ultimately succeed in school...than their counterparts in rural and particularly in remote areas’. The hypothesis that retention rates will decrease with increasing remoteness is therefore applied to assist in investigating this issue.

Due to the nature of this essay, the scale of the whole Australia is beyond the scope of the study. Limiting to a single state results in a more in-depth analysis; better utilising case studies and primary research to explore the relationship between location and educational attainment.

Currently, the indigenous population is not distributed evenly across all states, with the northeastern state of Queensland chosen for analysis partly due to its large indigenous population (Figure 5).

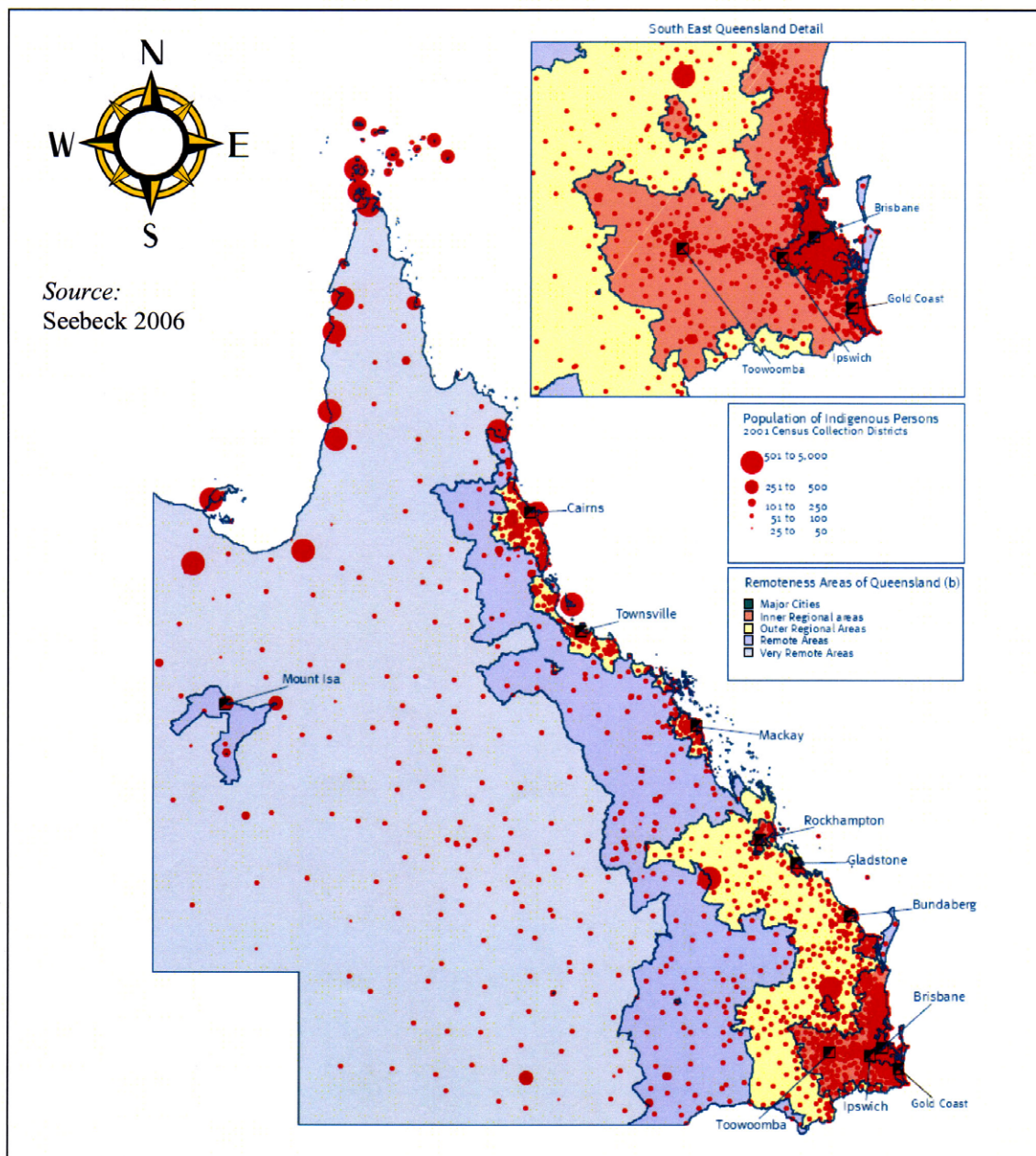
Figure 5: Proportion of the population in each State and Territory, 2001



“Overcoming Indigenous Disadvantage: Key Indicators 2005”, Gary Banks, Steering Committee for the Review of Government Service Provision, 2005, copyright Commonwealth of Australia reproduced by permission.

Queensland also shows the same indigenous population distribution patterns as Australia: the majority living on the urban east-coast but a great many living in the more rural ‘outback’ to the north and west (Figure 6). Historically, outback Queensland was not immediately colonised due to the hot temperatures, isolation and lack of arable land (Salt 1999) and ‘it was not until the last quarter of this century that [Australians]...quite suddenly embraced and further ‘colonised’ the northern coast of the eastern seaboard’ (Salt 1999) Rural residing indigenous people were hence left alone until then, partially resulting in the relatively large rural population today. This indigenous population distribution makes Queensland an ideal state to investigate the research topic in depth.

Figure 6: Indigenous Population Distribution, Queensland, Remoteness Areas, 2001



Thus, the research question of '*what is the effect of location on the education attainment of indigenous secondary students in Queensland?*' concerns itself with spatial and social issues regarding education and the indigenous population of Queensland, Australia.

Although indigenous Australians live further away from educational services than non-indigenous Australians, distance decay can only play a partial role in poor indigenous retention rates. The effects of colonisation such as racism and the disregard to indigenous culture, coupled with their current social disadvantages including low personal wealth and lack of indigenous teachers, must also be taken into account. In all, the reasons behind the low retention rates of indigenous students are complex involving both geographical and social factors, rooted in Australia's colonial history.

Method of Data Collection

This investigation compares primary and secondary data, enabling an in-depth case study approach complementing general data on indigenous Queensland students. Twenty-seven responses to an original electronic questionnaire serve as primary data [Appendix 2]. Secondary data was acquired through various sources including the Australian Bureau of Statistics (ABS), the Macquarie Atlas of Indigenous Australia, and the Queensland State Government.

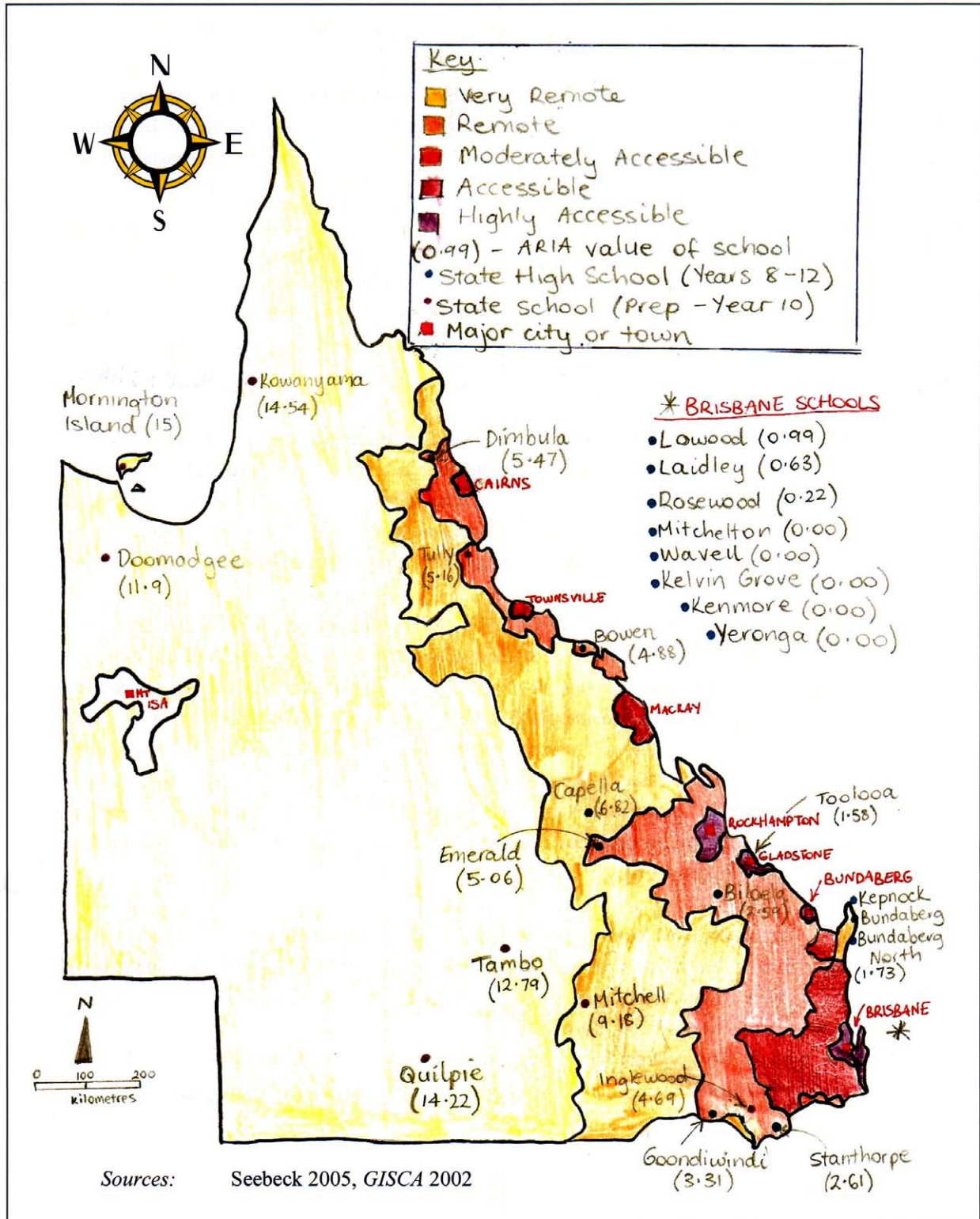
The '*Indigenous Australian Secondary Student Survey*' is an original survey created to test the hypothesis using an online survey software program, Survey Monkey. This enabled users to access and complete the survey over the Internet by ticking relevant boxes and adding comments. This method enables fast responses from extensive samples: both rural and urban regions of Queensland.

Prior research determined the nature of the questions, collecting data on subjects relevant to the research question [Appendix 1]. The following four categories transpired: school location, current retention rates, why this is occurring and what is being done about it. The questions not only reveal the current situation regarding indigenous educational attainment, but also aim to determine whether rural schools are disadvantaged in this regard due to their location.

The Accessibility/Remoteness Index of Australia (ARIA) defines degrees of remoteness used in this essay. This index is the standard method of quantifying accessibility used by the ABS, basing rural and urban classifications on physical accessibility to service centres rather than population size (*Measuring Remoteness* 2001). Using the official ARIA website (*GISCA* 2002) to calculate exact ARIA values of Queensland towns, each school that responded to the survey was given a remoteness value (Figure 7) and consequent category [Appendix 4]. To make statistics tests such as Spearman's Rank Correlation Coefficient (SRCC) possible, a number was assigned to each survey response in class intervals for correlations between location and survey responses [Appendix 6].

Secondary data is also used to gain an overview of Queensland's indigenous secondary student population. It includes statistics on the retention rates and population distribution of indigenous students, as well as data complementing and validating the primary data. The last Australian census was conducted in 2001, so due to the timing of this essay these otherwise reliable statistics from the ABS will not represent the most recent situation. Secondary data is obtained with the aim of keeping the primary data relevant and accurate, and contrasting case studies to a larger scale.

Figure 7: Location of surveyed schools according to ARIA classification



Considerations regarding data

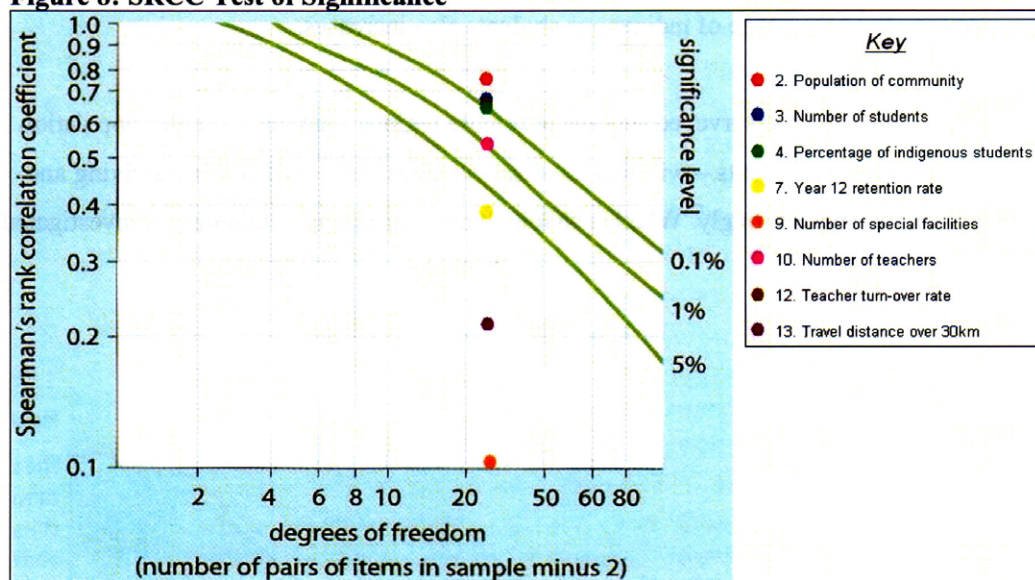
The surveyed schools are located throughout Queensland, with most on the urbanised eastern coast (Figure 7). To investigate extent of which being rural or urban determines indigenous retention rates, the survey responses are analysed in terms of ARIA categories of remoteness [Appendix 4]. However, the difference in sample size of each category makes it difficult to generalise statements (Table 1) according to this external system. This must be taken into account when viewing primary data analysis.

Table 1: Sample size according to ARIA category

ARIA category	ARIA value	Sample size
Highly Accessible	0 – 1.84	12
Accessible	>1.84 – 3.51	3
Moderately Accessible	>3.51 – 5.80	5
Remote	>5.80 – 9.08	1
Very Remote	>9.08 – 12	6

Additionally, the relationship of many survey questions with remoteness could be tested using SRCC, however not all correlations could be used to test the hypothesis (Figure 8). Questions regarding Year 12 retention rate, travel distance and the number of special facilities available have over a 5% significance level: there is a high chance that the correlation occurred randomly. All other questions have strong enough correlations to be applied accurately to the investigation.

Figure 8: SRCC Test of Significance



School profiles

The following survey questions looked to determine the effect location has on the schools' and their communities' population composition, which may provide insight into the various explanations for current indigenous retention rates.

'What is the population of the community where your school is located?'

The results show a very strong correlation between community population and remoteness, with an SRCC value of -0.751 : an increase in remoteness leads to a decrease in community population. This supports the settlement hierarchy concept (Figure 4), where fewer people in remote areas leads to fewer services.

'How many students in total are enrolled at your school?'

A strong negative correlation of -0.695 shows that with an increase in remoteness there is a decrease in high school students. The settlement hierarchy can also be applied here to ascertain that a school with fewer students will demand fewer resources and services, resulting in an educational disadvantage to the students who are enrolled there.

'What is the approximate percentage of indigenous Australian students in your school?'

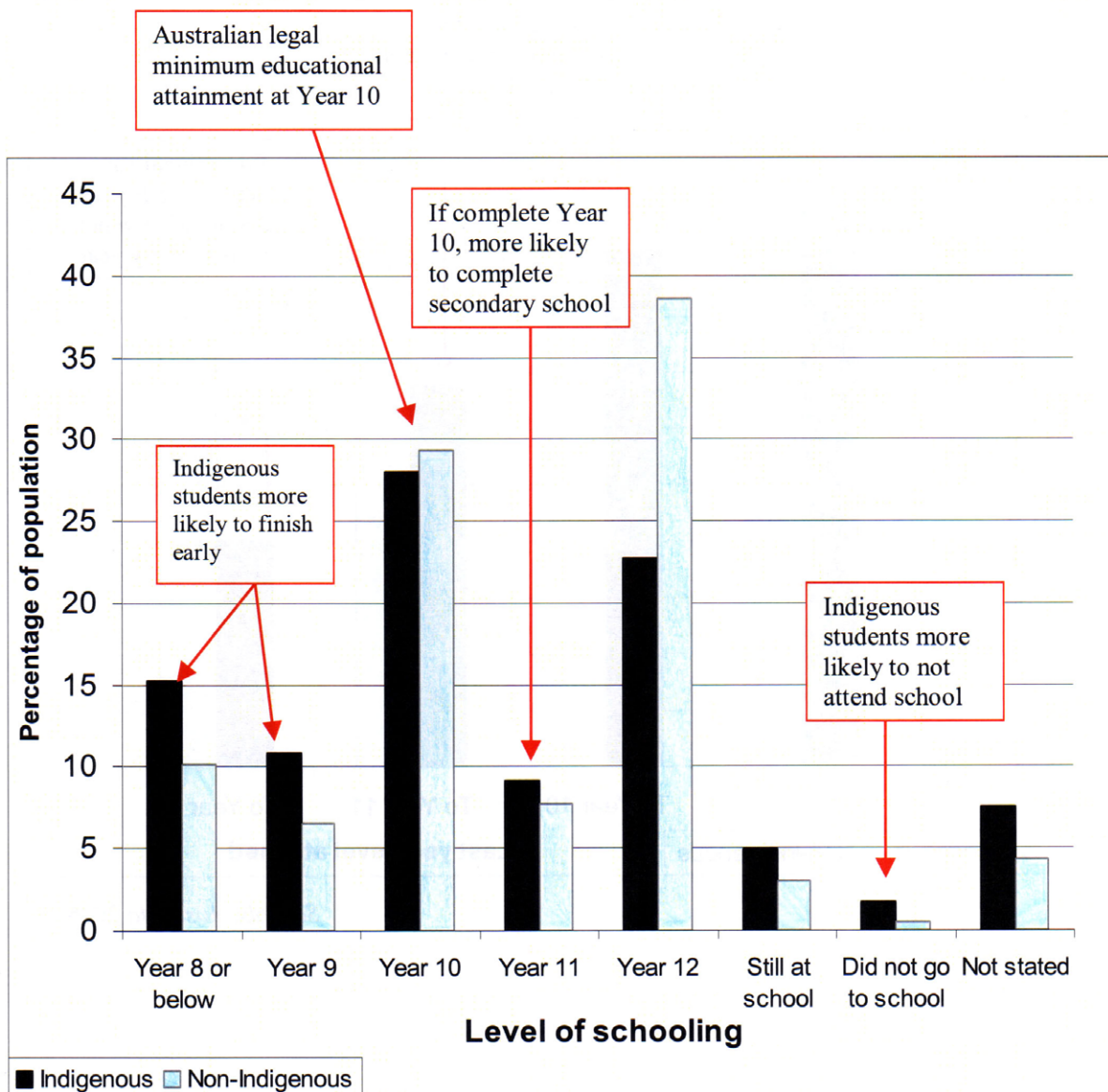
This educational disadvantage all too often includes indigenous students who make up the majority of rural schools. The strong negative correlation of 0.683 shows that with an increase in remoteness, the percentage of indigenous students also increases.

According to this data, the surveyed schools in remote regions - having a smaller population with more indigenous students - will feel the disadvantages associated with rural living and being indigenous, more strongly. Whether that includes educational attainment is investigated in this essay.

Current spatial patterns regarding indigenous educational attainment

Indigenous Australians generally have lower secondary education retention rates than non-indigenous Australians (Banks 2005), with this pattern also evident in Queensland (Figure 9).

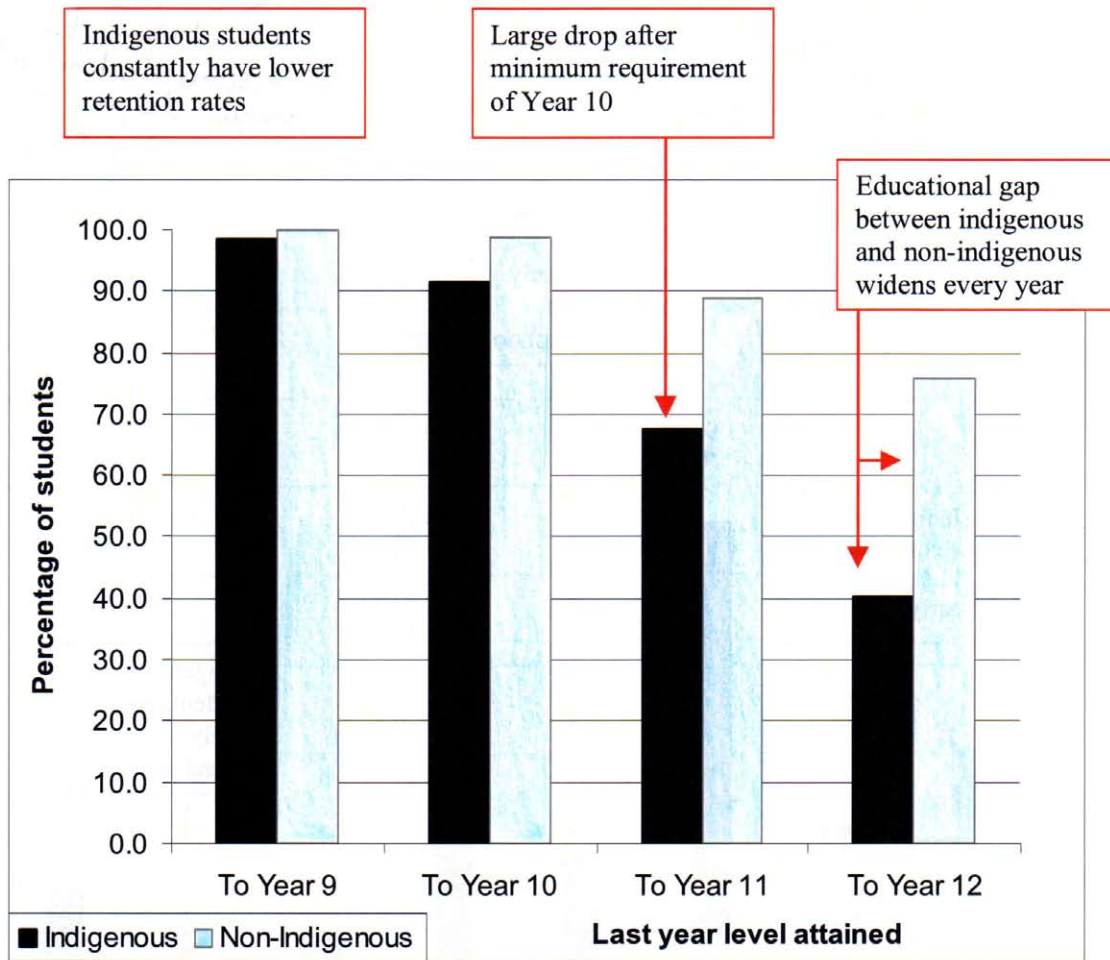
Figure 9: Highest level of schooling completed, Queensland 2001



Source: Seebeck 2006

In addition, the chance of indigenous students staying in school decreases with age (Figure 10) resulting in a lack of advanced literacy and numeracy skills in the indigenous population.

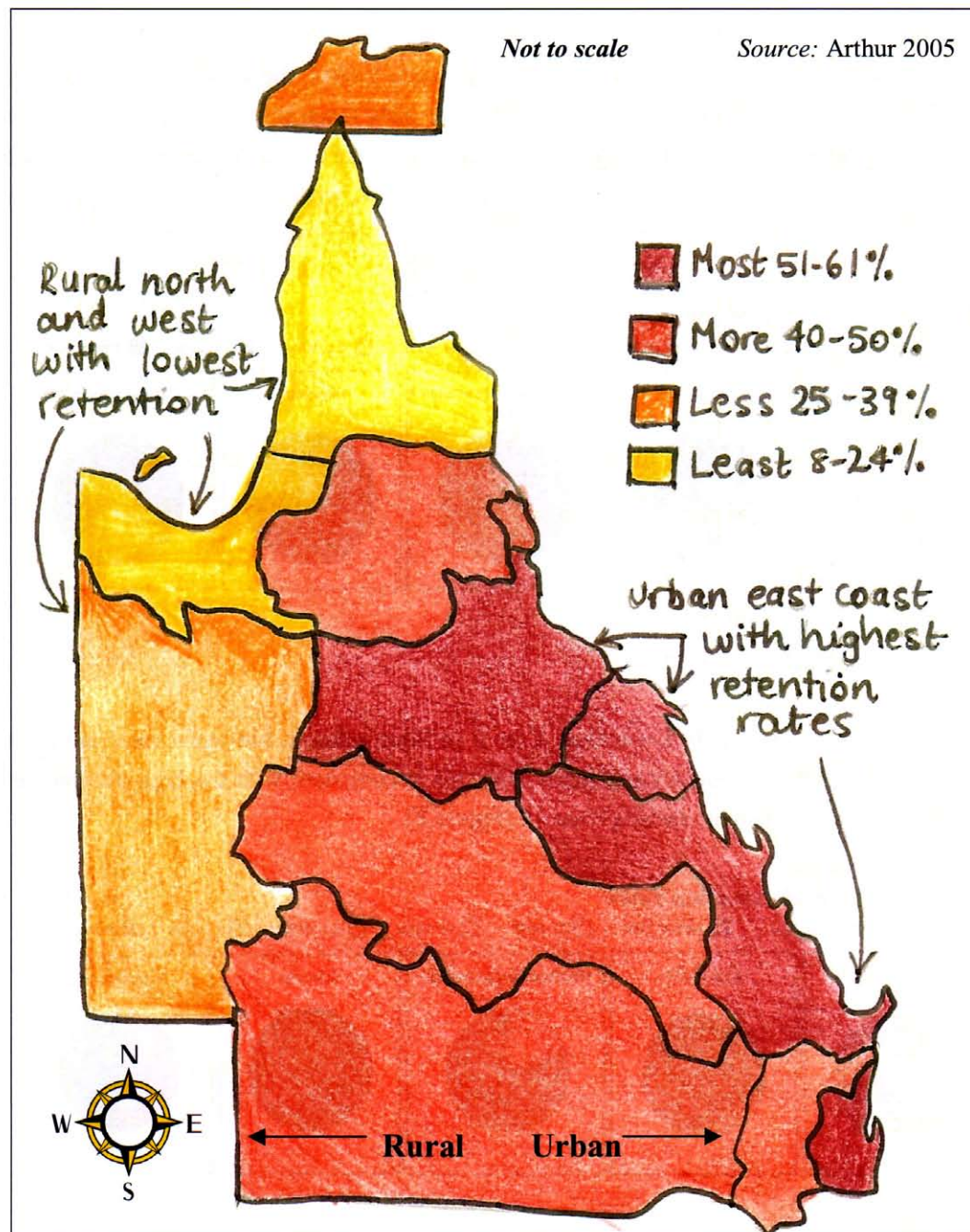
Figure 10: Apparent Retention Rates, Full-time Australian secondary students, indigenous and non-indigenous



Schools, Australia 2006

Furthermore, the discrepancy between indigenous educational attainment in rural and urban regions of Queensland (Figure 11) show that students of the rural northwest are less likely to be attending school than those to the urban southeast. Therefore, the most educationally disadvantaged population are rural indigenous Queenslanders of age Years 10 to 12 equivalent.

Figure 11: Percentage of adolescents aged 15-19 engaged in study, 2001

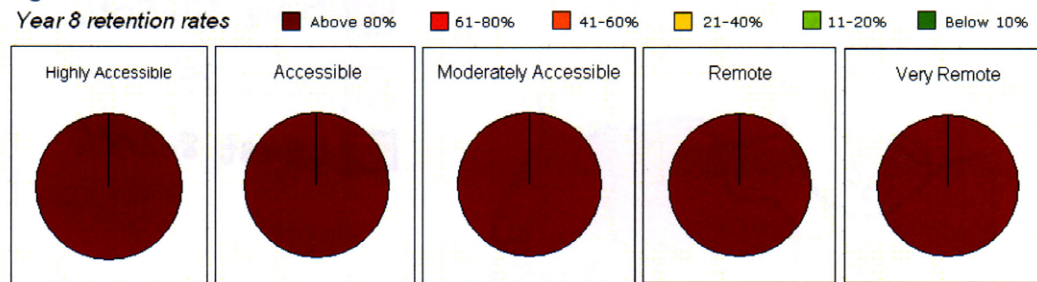


According to this secondary data, indigenous retention rates decrease over distance and time. To confirm this general trend (Figure 11), three survey questions responded directly to educational attainment: ‘What proportion of your indigenous Australian students reach Year 8/ Year 10/ Year 12?’ These three attainment levels are discussed with references to the survey responses.

Year 8 educational attainment:

The primary data shows most indigenous students reach Year 8, the second year of secondary school (Figure 12). All schools responded that over 80% reach this year, demonstrating that indigenous educational attainment is not an issue at this age and is not affected by location. This is consistent with retention rates displayed in Figure 8, where a relatively low percentage of indigenous students leave after Year 8.

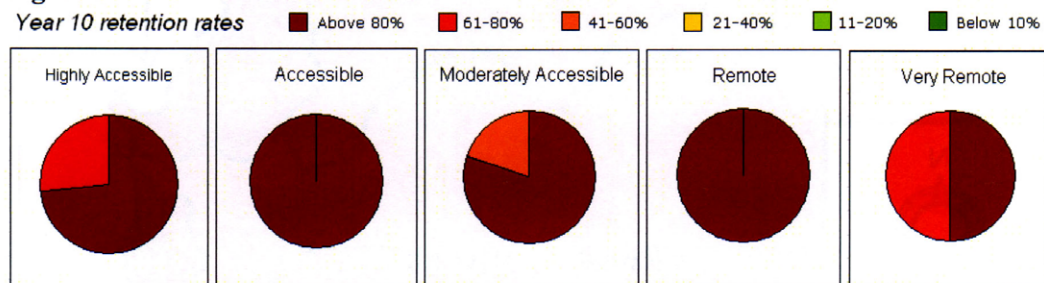
Figure 12: Year 8 retention rates



Year 10 educational attainment:

Year 10 retention is slightly lower than Year 8 in these schools, but again most indigenous students attain Year 10 education (Figure 13). This is consistent with the high percentage of indigenous students shown reaching Year 10 (Figure 8).

Figure 13: Year 10 retention rates



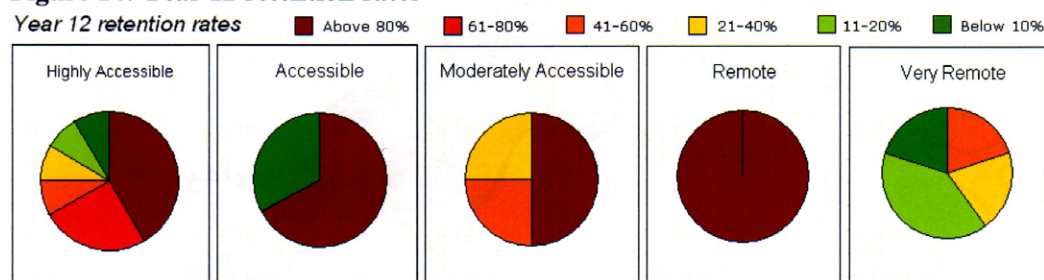
Thus far, there is very little correlation between remoteness and retention. Over 27% of schools in Highly Accessible regions responded that 61-80% of their indigenous students reached Year 10, compared to 50% of schools in Very Remote regions. However, the schools in between do not support the hypothesis, especially the high Year 10 attainment in the only Remote

representative, Capella State High School. Capella is an anomaly in that as a Remote community, only around 2% of the region's population is indigenous (ABS 2001). This is due to its 'white settler' heritage in the mining and agricultural sector, resulting in a predominantly monocultural population (*Walk About* 2004). This is shown through the school's response that less than 5% of the students are indigenous (if any) and consequently, indigenous retention is constantly above 80% in all years. Therefore if the Remote representative showed less educational attainment, a stronger correlation would result.

Year 12 educational attainment:

Year 12 attainment shows much more variation over distance, but only a slight correlation (Figure 14). Notably, no Very Remote schools reported that above 80% of indigenous students reach Year 12, which supports the hypothesis. However the fact that Highly Accessible schools showed the most variation demonstrates how location is not the only factor that influences retention rates. Again, the anomaly to the Figure 14 pattern was the sole Remote representative for the same reasons as discussed.

Figure 14: Year 12 retention rates

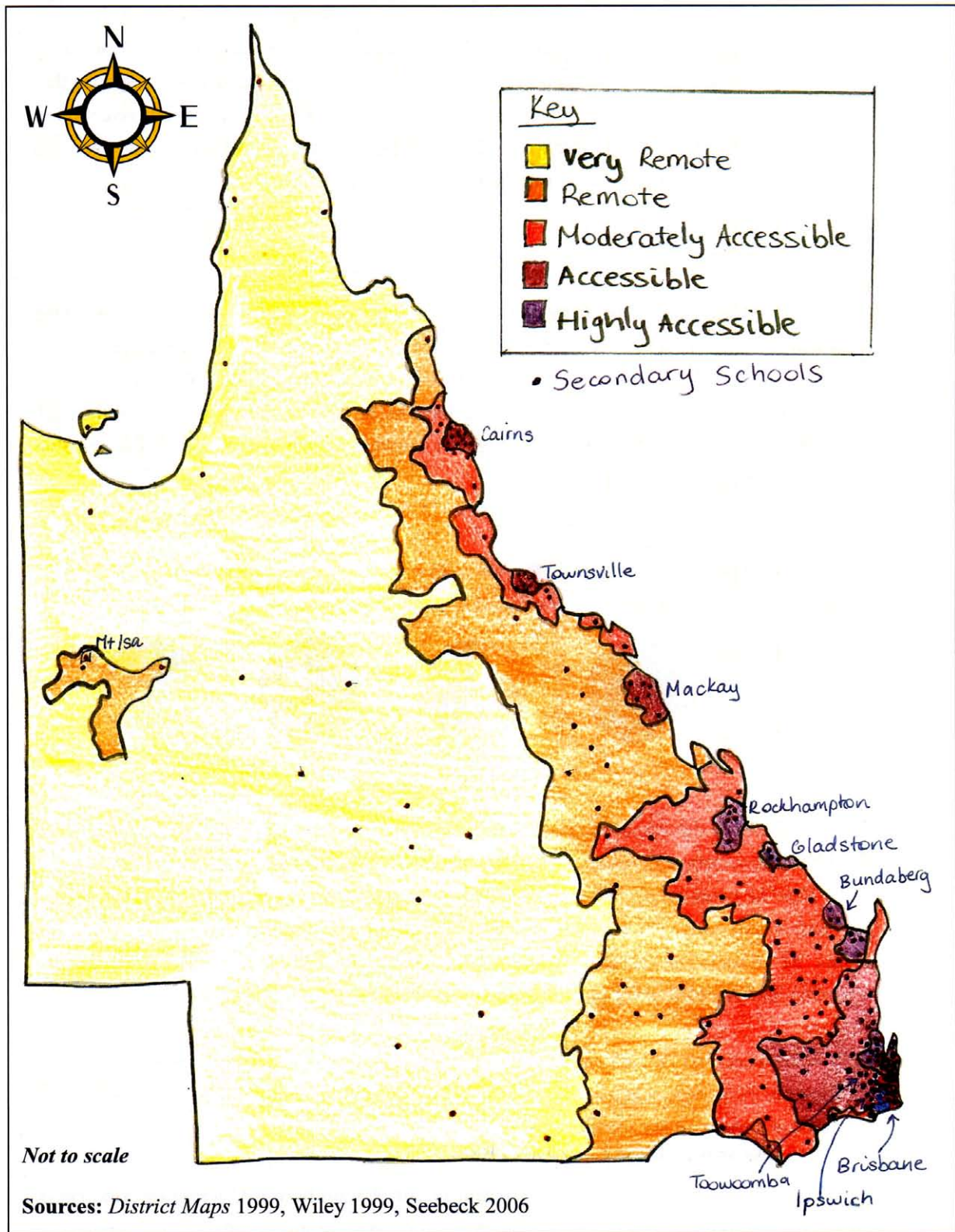


SRCC was used to determine the correlation between distance and Year 12 retention, as there was sufficient variation in results. The slight negative correlation of -0.4 shows that to some extent Year 12 retention decreases with increasing remoteness. The test of significance shows this result is just under 5% significance and can be cautiously used to support the hypothesis (Figure 8). Anomalies include 'Below 10%' schools Rosewood and Biloela in Highly Accessible and Accessible regions respectively, and Capella as discussed.

Both Rosewood and Biloela have less than 5% indigenous students, and after email confirmation from these schools, the anomalous low retention rates have been identified as due to confusion answering the survey.

In general, the primary data demonstrates negative correlations between increasing remoteness and decreasing retention rates, and notably the discussed results of the Remote and Very Remote schools will influence correlations as discussed. Thus far, the results support the hypothesis.

Figure 15: Queensland secondary school distribution

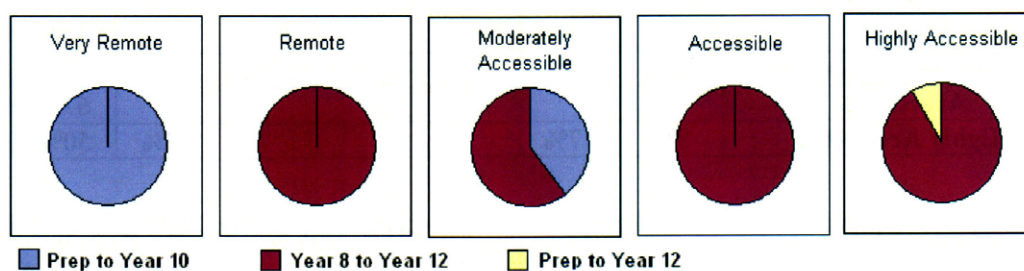


Direct spatial influences on indigenous secondary school retention patterns

The changing accessibility of secondary schools over distance directly influences said patterns. This directly relates to Christaller's Central Place Theory, which states that settlements' size, distance apart and consequent sphere of influence affects the range or maximum distance that people are willing to travel to obtain services. With increasing remoteness, the size and number of services of Queensland settlements decreases and larger settlements with the necessary secondary education occur further apart, further distance from remote settlements. The number of Queensland secondary schools decreases with remoteness (Figure 15) and 'access to schools is often more difficult in remote regions simply because there are fewer schools' (Biddle, Hunter, Schwab 2004). Prolonged travel time, complicated travel routes to school and the increased cost of petrol money all due to reduced school accessibility in rural areas, can result in children not attending school at all (NIRRE 2000).

Rural schools are more likely to combine primary and secondary education – from Prep to Year 10 – while urban schools are separated and comprise years 8 to 12 (Figure 15). This results in around 81% of Queensland communities being further than 50km away from a secondary school up to Year 12 (Arthur 2005). This pattern is also reflected in the surveyed schools (Figure 16).

Figure 16: Type of secondary schools surveyed



Most remote communities do not reach the threshold population size for Year 12 schools, thus secondary schools are located further apart in remote locations. Therefore regarding secondary education, school accessibility and remote location plays an important role in the range indigenous people are prepared to travel. As secondary education is considered a higher order service that generally occurs in larger settlements, the importance indigenous Australians place on obtaining it may decrease the range they will travel and therefore have a negative effect on educational attainment.

Therefore, Year 12 educational attainment should be lower in rural areas because there are fewer schools that reach this year. Surveyed Very Remote schools such as Quilpie and Kowanyama that only reach Year 10 but responded 41-60% and 21-40% respectively for Year 12 retention, highlight the fact that these survey responses were estimated by Principals and may not always represent the true situation accurately.

According to the respondent from Mitchell State School (Very Remote),

“Mitchell State School only goes to Year 10. After this, the students need to travel to Roma, which is 90kms away. I believe this can have a significant aspect on some of the students completing Year 12.”

Mitchell State School 2007

This demonstrates the direct influence of location on secondary school retention. However, the survey results seem to contradict this evidence, showing that the factor ‘Distance to school is too far’ does not increase in importance with increasing remoteness (Table 2). The percentage of students travelling over 30km to school also showed very little correlation with remoteness, with an SRCC value of 0.21.

Table 2: Distance to school is too far

Region	Order of importance in affecting retention rates						
	1	2	3	4	5	6	N/A
Very Remote	17%					33%	
Remote							100%
Moderately Accessible	20%				20%	40%	20%
Accessible							67%
Highly Accessible	8%	17%				17%	50%

To attempt to explain this trend, a Highly Accessible school respondent highlights how in urban areas, a loss of housing and consequent relocation further from school can be responsible for low retention rates:

“Students come to Mitchelton High from the surrounding area as well as students who catch the train from other parts of Brisbane. Our indigenous students who we have not been effective in retaining often enrol when living in the local area, however lose their housing and continue to try and catch the train to school. Students then seem to get lost on the train system...and absenteeism/family problems effect successful completion of high school.”

Mitchelton State High School 2007

As indigenous Australians are generally less financially secure than other Australians (Seebeck, Shepherd, Smith, Taylor, Taylor & Thompson 2006), this could partially justify the emphasis on accessibility in surveyed urban schools. Another factor is embedded in the ambiguous nature of the question: 'distance to school too far' as a 'factor that most affects the retention rate of indigenous students at your school'. The wording of this question does not clearly acknowledge that remote schools only reach Year 10. For example, while the Mitchell State School respondent identified that to reach Year 12, students must travel 90km to Roma, 'Distance to school too far' was classed as the least important factor regarding educational attainment. Therefore, if this question was worded more clearly to emphasise 'accessibility' rather than 'distance', the primary data may have better supported the secondary research.

In short, the location of secondary schools in Queensland directly influences retention rates: accessibility decreases with increasing remoteness. While secondary research has identified this as an important factor, primary data has revealed that it may not be the *most* important factor for low indigenous retention rates. In fact, social reasons specific to the indigenous population may be more pivotal to this educational disadvantage. As the indigenous proportion of population increases with remoteness (Banks 2005), these effects may be more prevalent with increasing remoteness and isolation. In this way, location can also indirectly influence indigenous secondary educational attainment.

Indirect spatial influences on indigenous retention rate patterns

The remaining survey questions investigated explanations behind the hypothesis, in order to determine whether location itself is the major factor, or whether it indirectly influences retention rates through other measures. These include school curriculum, teachers, family problems and economic disadvantage.

Firstly, many indigenous Australians do not have a ‘strong commitment to formal western education because it sometimes lacks relevance for their lives’ (Biddle, Hunter, Schwab 2004) as indigenous language, culture and history are often neglected in secondary school curriculum (NIRRE 2000). As remote schools have a higher proportion of indigenous students, they should already cater for indigenous language and culture in their curriculum; hence this lack should have greater effects in urban areas:

Table 3: Curriculum lacks relevance

Region	Order of importance in affecting retention rates						
	1	2	3	4	5	6	N/A
Very Remote			17%	50%	17%		
Remote			100%				
Moderately Accessible		40%	20%		20%		
Accessible		33%					33%
Highly Accessible	8%		25%	17%	8%		17%

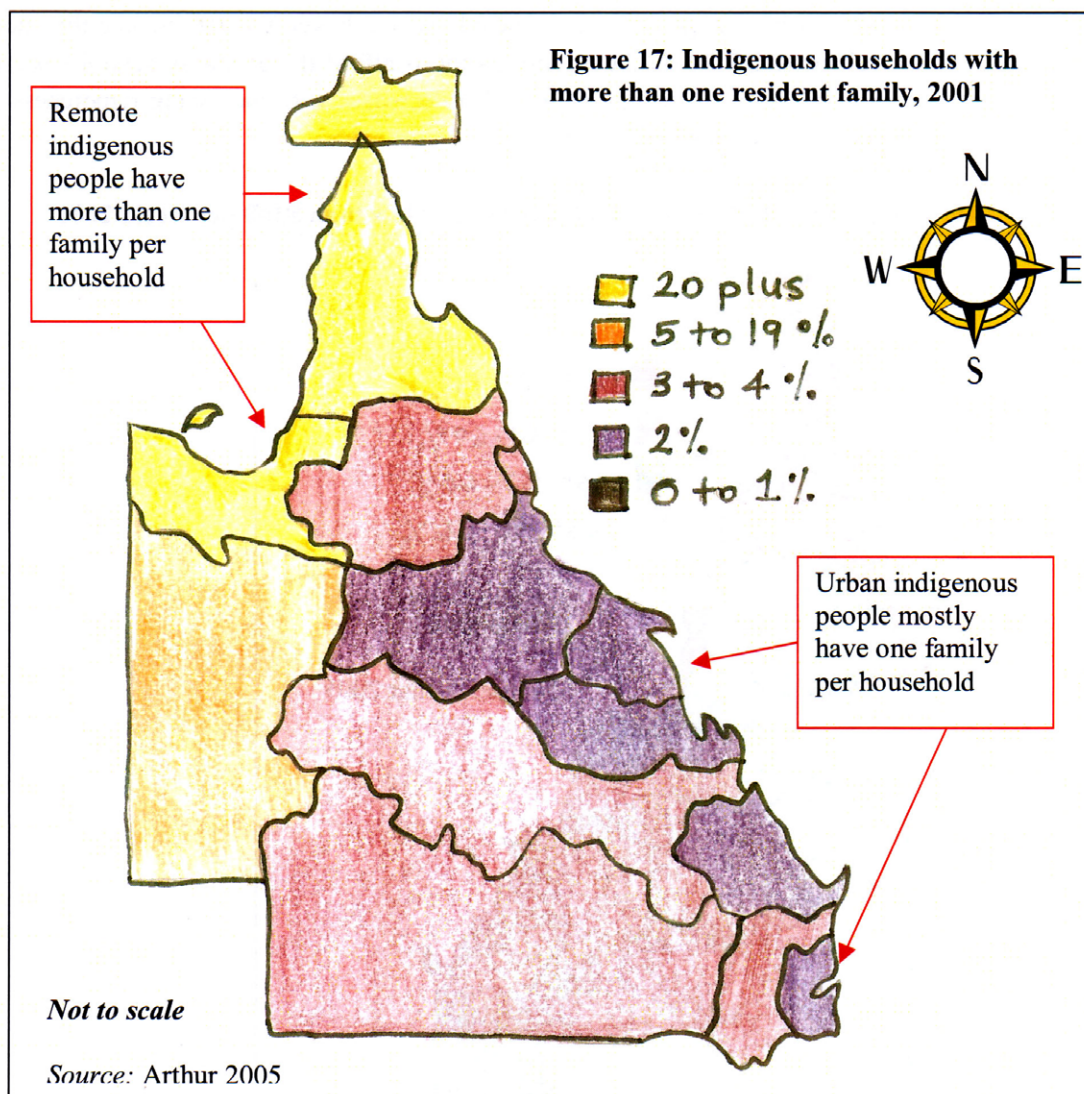
This assertion is accurately represented in the survey results (Table 3), with accessible areas more likely to rate this factor in the top three most important factors. A major cause for the lack of indigenous-relevant curriculum is highlighted by the Independent Education Union of Australia:

“Few teachers can report that their initial training and qualification has properly prepared them to either teach Indigenous students or to provide non Indigenous students with an understanding of the history and culture of Australia's Indigenous peoples.” (IEUA 2002)

Therefore it is clear that teachers – especially indigenous teachers – play an important role in making secondary school enjoyable and relevant for indigenous students.

The corresponding survey results reveal that only Mornington Island and Kowanyama – the two least accessible schools in communities with the highest proportion of indigenous people – responded with having ‘3-5’ indigenous teachers; every other school surveyed responded with ‘0-2’. This does not seem to be directly related to location, but rather as an extension of the number of indigenous people in the community – a factor that *is* related to location as discussed.

Indigenous Australians are ‘disproportionately classified as poor and typically crowded’ (Biddle, Hunter, Schwab 2004) and the likelihood of an indigenous student living in a multi-family household increases with increasing remoteness (Figure 17). Disruptions at home such as noise, abuse, arguments and deaths of family members, will be more prevalent and impair the school experience, often resulting in the discontinuation of schooling (Biddle, Hunter, Schwab 2004).



The corresponding primary data demonstrates that this factor is most influential to retention across all surveyed regions (Table 4). Additionally, it is evaluated as more important in remote communities than accessible. There is also an increase in ‘least important’ (6) and ‘not applicable’ (N/A) ratings with increasing accessibility.

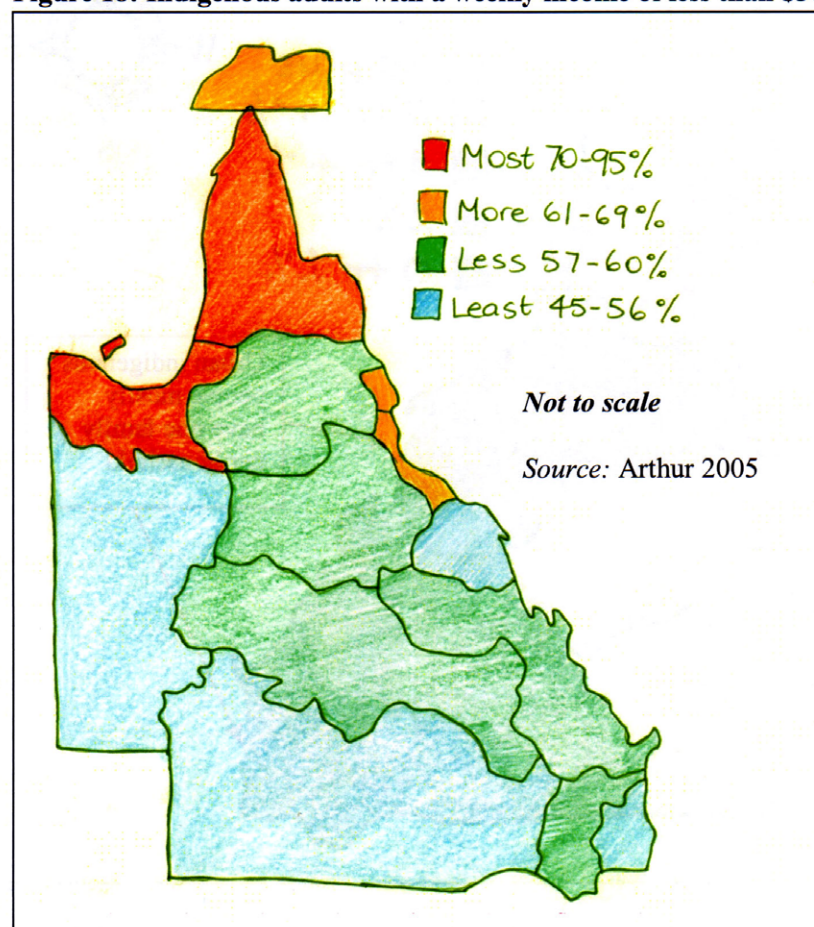
Table 4: Family/disturbances at home (e.g. Death, abuse)

Region	Order of importance in affecting retention rates						
	1	2	3	4	5	6	N/A
Very Remote	83%						
Remote							100%
Moderately Accessible	40%	20%				20%	
Accessible		33%					67%
Highly Accessible	33%	17%				17%	8%

This demonstrates how an increase in likelihood of family disturbances with remoteness deters education: location indirectly influencing attainment levels.

Regarding economic disadvantage, indigenous people have a lower average income than non-indigenous Australians (ABS 2001), being less likely to afford the everyday school costs of books, school fees and petrol. Average income also decreases with increasing remoteness in the case of indigenous Queenslanders (Figure 18).

Figure 18: Indigenous adults with a weekly income of less than \$300 per week, 2001



Therefore, as a lack of income will have a negative effect on indigenous secondary educational attainment and indigenous income decreases with remoteness, this factor should be more important with increasing remoteness (Table 5).

Table 5: Financial restrictions (e.g.. Cannot afford school fees, books, petrol for transport)

Region	Order of importance in affecting retention rates						N/A
	1	2	3	4	5	6	
Very Remote		33%	33%	17%			17%
Remote							100%
Moderately Accessible		20%	60%	20%			
Accessible				33%			67%
Highly Accessible		17%	25%	8%	8%		17%

The survey results support this concept, with a decrease in schools rating it second, and an increase in low importance (fourth and fifth) with increasing accessibility. Noticeably a significant percentage of schools believe this factor is not applicable, and after reviewing the question, the fact that Australian government schools are subsidised and fees are minimal if any, may have deterred the respondent from rating this highly without considering other financial burdens associated with schooling. As the secondary data establishes, indigenous Australians are economically disadvantaged and financial restrictions do contribute to low retention rates.

While at the time these surveyed factors seemed relevant, the prevalence of 'Not Applicable' responses revealed the need for an 'Other' section allowing additional information, making this investigation more accurate and informative. In any case, the higher proportion of indigenous people in remote areas leads to an amplification of indigenous-specific factors that influence retention rates. This then supports the hypothesis that location can indirectly influence indigenous secondary educational attainment through other measures.

Conclusion

Two issues were explored in this essay: whether indigenous educational attainment is directly affected by location or whether it is more influenced by other factors that also change over distance. All issues reflected the concept of a settlement hierarchy: with increasing rurality, population and educational services decreased. As the proportion of indigenous people increased with rurality, they are educationally disadvantaged.

Firstly, according to secondary evidence, indigenous secondary school retention rates support the hypothesis in that educational attainment decreases with increasing remoteness. The primary data shows correlation between the two factors, but not enough to clearly support the hypothesis.

Secondly, the effects of other indigenous-specific factors influencing retention rates including travel distance, relevant curriculum, home disruptions, financial restrictions and drug dependency are all amplified with increasing remoteness. This shows correlations between indirect influences on educational attainment and location. These factors were analysed in order to explain attainment patterns, but direct links based on an individual school level could not be made due to the complexity of the task.

The issue of indigenous secondary educational attainment is complex and concerns historical, social and economic influences as well as the geographical influences explored in this study. Explanations behind attainment levels can be attributed to location, being indigenous, or even both, highlighting the complexity of the issue. Therefore the unanswered question of whether location or being indigenous is more detrimental to educational attainment remains unresolved.

Evaluation

It is imperative to point out that there are many unanswered questions and unexplored pathways associated with social issues such as this one, which could not be investigated due to the limited scope and resources of this essay. Reasons why children cease secondary education can range from personal subjective issues on a social level, to large-scale objective geographical theories. This makes it difficult to analyse this issue in great depth, and generalisations may not always be accurate.

Though some of the important factors affecting indigenous educational attainment were touched upon in this essay, the effect of poor health associated with the indigenous population was one that could have also been explored. Other issues including the effects of drugs (especially petrol sniffing addictions), having poor literary and numeracy skills, racism and low self-determination, all deter indigenous children from staying in school. A purely geographical analysis of indigenous retention rates will fail to acknowledge these important factors that act on an individual social level.

Additionally, this study used one statistic or map to display a general pattern. To explore patterns in more depth, statistics from a wider range of sources could be analysed and compared against each other.

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Appendix 1: Copy of Survey

Indigenous Australian Secondary Student Survey

1. What is the name of your school and where is it located in Queensland?

Name of school:

Location:

2. What is the population of the community where your school is located?

- Below 200 people
 200 - 999 people
 1,000 to 19,999
 20,000 to 49,999
 50,000 to 99,999
 Above 100,000

3. How many students in total are enrolled at your school?

- 0 to 49
 50 to 99
 100 to 499
 500 to 9999
 Above 1000

4. What is the approximate percentage of Indigenous Australian students in your school?

- Below 5%
 6 - 10%
 11 - 20%
 21 - 30%
 31 - 50%
 51 - 70%
 more than 70%

5. What proportion of your Indigenous Australian students reach Year 8?

- Below 10%
 11 - 20%
 21 - 40%
 41 - 60%
 61 - 80%
 Above 80%

6. What proportion of your Indigenous Australian students reach Year 10?

- Below 10%
 11 - 20%
 21 - 40%
 41 - 60%
 61 - 80%
 Above 80%

7. What proportion of your Indigenous Australian students reach Year 12?

- Below 10%
 11 - 20%
 21 - 40%
 41 - 60%
 61 - 80%
 Above 80%

8. Number in order of importance (1 being most important), the factors that most affect the retention rate of Indigenous students at your school.

	1 (most)	2	3	4	5	6 (least)	N/A
Distance to school is too far	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Curriculum lacks relevance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough support from school or community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family/ disturbances at home (e.g. death, abuse)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial restrictions (e.g. cannot afford school fees, books, petrol for transport)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student affected by drugs or alcohol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The effect of location on the educational attainment of indigenous secondary students in Queensland, Victoria

9. Are there any special facilities available for Indigenous Australian students to assist in retention rates?
Please tick the appropriate boxes.

- Organised transport to and from school
- Financial subsidies
- English as a Second Language (ESL) classes
- Different subjects
- Counsellors or Indigenous Coordinators
- Involvement in the community
- Special events (e.g. 'Cultural awareness day')
- Other (please specify)

10. How many teaching staff in total do you employ?

- 0 - 5 6 - 10 11 - 20 21 - 50 Above 50

11. Of this total, how many teachers are of Indigenous background?

- 0 - 2 3 - 5 6 - 10 Above 10

12. What is the average teacher turnover rate per year at your school?

- Less than 5% 6 - 10% 11 - 20% Above 20%

13. What proportion of your students travel over 30km to get to school?

- Less than 5% 6 - 10% 11 - 20% 21 - 30% 31 - 50% 51 - 70% Above 70%

14. Any other comments

Done >>

Appendix 2: Survey Results

I. School name	ARIA value	ARIA category	2. Pop of community	3. No. of students	4. % of Ind.s	5. Year 8s	6. Year 10s	7. Year 12s	9. # special facilities	10. Teachers	11. Ind. teachers	12. Turnover	14. Travel >30km
Mornington Island SS	1.5	Very Remote	1,000 to 19,999	100 to 499	>70%	>80%	61-80%	11-20%	10	21-50	3-5	11-20%	<5%
Kowanyama SS	14.54	Very Remote	1,000 to 19,999	100 to 499	>70%	>80%	>80%	21-40%	2	11-20	3-5	>20%	<5%
Quilpie SS	14.22	Very Remote	200-999	50 to 99	21-30%	>80%	>80%	41-60%	4	6-10	0-2	>20%	<5%
Tambo SS	12.79	Very Remote	<200	50 to 99	6-10%	>80%	>80%	<10%	3	6-10	0-2	6-10%	31-50%
Doomadgee SS	11.9	Very Remote	1,000 to 19,999	100 to 499	>70%	>80%	61-80%	11-20%		21-50	0-2	>20%	<5%
Mitchell SS	9.18	Very Remote	1,000 to 19,999	100 to 499	21-30%	>80%	61-80%		3	11-20	0-2	11-20%	11-20%
Capella SHS	6.82	Remote	1,000 to 19,999	100 to 499	<5%	>80%	>80%	>80%	3	11-20	0-2	6-10%	51-70%
Dimbulah SS	5.47	Moderately Accessible	1,000 to 19,999	100 to 499	11-20%	>80%	>80%	>80%	3	11-20	0-2	<5%	11-20%
Tully SS	5.16	Moderately Accessible	1,000 to 19,999	500 to 999	11-20%	>80%	41-60%	21-40%	2	>50	0-2	6-10%	6-10%
Emerald SHS	5.06	Moderately Accessible	1,000 to 19,999	500 to 999	6-10%	>80%	>80%	61-80%	5	21-50	0-2	11-20%	21-30%
Bowen SHS	4.88	Moderately Accessible	1,000 to 19,999	500 to 999	11-20%	>80%	>80%	>80%	4	21-50	0-2	11-20%	6-10%
Inglewood SS	4.69	Moderately Accessible	1,000 to 19,999	100 to 499	6-10%	>80%	>80%		4	11-20	0-2	<5%	<5%
Goondiwindi SHS	3.31	Accessible	1,000 to 19,999	100 to 499	6-10%	>80%	>80%	>80%	2	21-50	0-2	6-10%	21-30%
Stanthorpe SHS	2.61	Accessible	1,000 to 19,999	500 to 999	<5%	>80%	>80%	>80%	2	>50	0-2	<5%	31-50%
Biloela SHS	2.59	Accessible	1,000 to 19,999	500 to 999	<5%	>80%	>80%	<10%	5	21-50	0-2	>20%	21-30%
Kepnock SHS	1.73	Highly Accessible	20,000 to 49,999	>1000	6-10%	>80%	61-80%	41-60%	5	>50	0-2	6-10%	<5%
Bundaberg SHS	1.73	Highly Accessible	50,000-99,999	>1000	11-20%	>80%	>80%	61-80%	6	>50	0-2	6-10%	11-20%
Bundaberg North SHS	1.73	Highly Accessible	50,000-99,999	500 to 999	<5%	>80%	>80%	61-80%	5	>50	0-2	6-10%	<5%
Toooloa SHS	1.58	Highly Accessible	20,000 to 49,999	>1000	6-10%	>80%	61-80%	21-40%	3	>50	0-2	<5%	<5%
Lowood SHS	0.99	Highly Accessible	1,000 to 19,999	500 to 999	<5%	>80%	>80%	>80%	5	>50	0-2	6-10%	<5%
Laidley SHS	0.63	Highly Accessible	1,000 to 19,999	500 to 999	6-10%	>80%	>80%	61-80%	3	21-50	0-2	6-10%	6-10%
Rosewood SHS	0.22	Highly Accessible	1,000 to 19,999	500 to 999	<5%			<10%	4	11-20	0-2		<5%
Mitchelton SHS	0	Highly Accessible	>100,000	500 to 999	6-10%	>80%	61-80%	11-20%	3	>50	0-2	<5%	6-10%
Wavell SHS	0	Highly Accessible	50,000-99,999	>1000	6-10%	>80%	>80%	>80%	4	>50	0-2	<5%	6-10%
Kelvin Grove SC	0	Highly Accessible	>100,000	>1000	<5%	>80%	>80%	>80%	1	>50	0-2		
Kenmore SHS	0	Highly Accessible	>100,000	>1000	<5%	>80%	>80%	>80%	1	>50	0-2	<5%	11-20%
Yeronga SHS	0	Highly Accessible	>100,000	500 to 999	<5%	>80%	>80%	>80%	5	21-50	0-2	<5%	<5%

Appendix 3: Survey Question 8 Responses

School name	ARIA value	ARIA category	Numbered in order of importance					
			Distance too far	Curriculum	Lack support	Dist at home	Financial restriction	Drugs/alc.
Mornington Island SS	15	VR	N/A	3	2	1	N/A	5
Kowanyama SS	14.54	VR	N/A	4	2	1	3	5
Quilpie SS	14.22	VR	6	4	3	1	2	5
Tambo SS	12.79	VR	N/A		6	1	3	4
Doomadgee SS	11.9	VR	1	5			4	3
Mitchell SS	9.18	VR	6	4	5	1	2	3
Capella SHS	6.82	R	N/A	3	N/A	N/A	N/A	N/A
Dimbulah SS	5.47	MA	1		5		2	6
Tully SS	5.16	MA	6	2	4	1	3	5
Emerald SHS	5.06	MA	N/A	5	2	6	3	1
Bowen SHS	4.88	MA	6	3	1	2	4	5
Inglewood SS	4.69	MA	5	2	6	1	3	4
Goondiwindi SHS	3.31	A	N/A	2	1	N/A	N/A	N/A
Stanthorpe SHS	2.61	A	N/A	N/A	N/A	N/A	N/A	N/A
Biloela SHS	2.59	A			3	2	4	1
Kepnock SHS	1.73	HA	6	1	5	2	3	4
Bundaberg SHS	1.73	HA	N/A		2		3	5
Bundaberg North SHS	1.73	HA	2					
Toolooa SHS	1.58	HA	N/A	3		6	4	5
Lowood SHS	0.99	HA	1		2	6		5
Laidley SHS	0.63	HA	6	3	4	1	2	5
Rosewood SHS	0.22	HA	N/A	4	1	2	3	N/A
Mitchelton SHS	0	HA		4			2	1
Wavell SHS	0	HA	N/A	3	4	1	5	2
Kelvin Grove SC	0	HA	2	5	3	1		
Kenmore SHS	0	HA	N/A	N/A	N/A	N/A	N/A	N/A
Yeronga SHS	0	HA	N/A	N/A	N/A	1	N/A	N/A

Appendix 4: ARIA Category Classification

To create an associated classification, ARIA values are grouped into five categories using 'natural breaks' in the 0 – 12 continuous variable:

1. **Highly Accessible** (ARIA score 0 - 1.84) - relatively unrestricted accessibility to a wide range of goods and services and opportunities for social interaction.
2. **Accessible** (ARIA score >1.84 - 3.51) - some restrictions to accessibility of some goods, services and opportunities for social interaction.
3. **Moderately Accessible** (ARIA score >3.51 - 5.80) - significantly restricted accessibility of goods, services and opportunities for social interaction.
4. **Remote** (ARIA score >5.80 - 9.08) - very restricted accessibility of goods, services and opportunities for social interaction.
5. **Very Remote** (ARIA score >9.08 - 12) - very little accessibility of goods, services and opportunities for social interaction

(*Measuring Remoteness 2001*)

Appendix 5: Percentage values for retention rate pie graphs

Year 8 retention rates

	Very Remote	Remote	Moderately Accessible	Accessible	Highly Accessible
>80%	100%	100%	80%	100%	100%
61-80%					
41-60%					
21-40%			20%		
11-20%					
<10%					

Year 10 retention rates

	Very Remote	Remote	Moderately Accessible	Accessible	Highly Accessible
>80%	50%	100%	80%	100%	73%
61-80%	50%				27%
41-60%			20%		
21-40%					
11-20%					
<10%					

Year 12 retention rates

	Very Remote	Remote	Moderately Accessible	Accessible	Highly Accessible
>80%		100%	50%	67%	42%
61-80%					25%
41-60%	20%		25%		8%
21-40%	20%		25%		8%
11-20%	40%				8%
<10%	20%			33%	8%

Appendix 6: Spearman's Rank Correlation Coefficient Workings

School name	ARIA Rank value	2. Pop of community	Rank d	d ²	3. # of students	Rank d	d ²	4. % of IAs	Rank d	d ²	7. Year Rank	Rank d	d ²
Mornington Island SS	15	1200	8	19	361	6.5	20.5	420.25	2	25	5	22	484
Kowanyama SS	14.54	1200	8	18	324	6.5	19.5	380.25	2	24	8	18	324
Quiptie SS	14.22	1085	5	20	400	1.5	23.5	552.25	4	23	10.5	14.5	210.25
Tambo SS	12.79	625	2	22	484	1.5	22.5	506.25	2	14	2	22	484
Doomadgee SS	11.9	1200	8	15	225	6.5	16.5	272.25	7	21	5	18	324
Mitchell SS	9.18	1100	6	16	256	6.5	15.5	240.25	4	4.5	20.5	0.5	0.25
Capella SHS	6.82	730	3	18	324	6.5	14.5	210.25	1	23	20.5	-0.5	0.25
Dimbulah SS	5.47	500	1	19	361	6.5	13.5	182.25	3	7.5	13.5	4.5	20.25
Tully SS	5.16	2800	11	8	64	16	3	9	3	7.5	8	11	121
Emerald SHS	5.06	14000	19	-1	1	16	2	4	2	14	13.5	4.5	20.25
Bowen SHS	4.88	9500	18	-1	1	16	1	1	3	7.5	20.5	-3.5	12.25
Inglewood SS	4.69	800	4	12	144	6.5	9.5	90.25	2	14	20.5	-5.5	30.25
Goondiwindi SHS	3.31	5000	14.5	0.5	0.25	6.5	8.5	72.25	2	14	20.5	-6.5	42.25
Stanthorpe SHS	2.61	5000	14.5	-0.5	0.25	16	-2	4	1	23	2	11	121
Biloela SHS	2.59	5746	16	-3	9	16	-3	9	1	23	1	11	121
Kepnock SHS	1.73	45000	22	-11	121	24.5	-13.5	182.25	2	14	10.5	0.5	0.25
Bundaberg SHS	1.73	45000	22	-11	121	24.5	-13.5	182.25	3	7.5	13.5	-2.5	6.25
Bundaberg North SHS	1.73	45000	22	-11	121	16	-5	25	1	23	13.5	-2.5	6.25
Tooloona SHS	1.58	27500	20	-11	121	24.5	-15.5	240.25	2	14	8	1	1
Lowood SHS	0.99	1700	10	-2	4	16	-8	64	1	23	20.5	-12.5	156.25
Laidley SHS	0.63	4000	13	-6	36	16	-9	81	2	14	13.5	-6.5	42.25
Rosewood SHS	0.22	3000	12	-6	36	16	-10	100	1	23	2	4	16
Mitchelton SHS	0	5900	17	-14	196	16	-13	169	2	14	5	-2	4
Wavell SHS	0	920,000	25.5	-22.5	506.25	24.5	-21.5	462.25	2	14	20.5	-17.5	306.25
Kelvin Grove SC	0	920,000	25.5	-22.5	506.25	24.5	-21.5	462.25	1	23	20.5	-17.5	306.25
Kenmore SHS	0	920,000	25.5	-22.5	506.25	24.5	-21.5	462.25	1	23	20.5	-17.5	306.25
Yeronga SHS	0	920,000	25.5	-22.5	506.25	16	-13	169	1	23	20.5	-17.5	306.25
Sum of d²					5735.5			5553					3631
n					27			27					25
SRCC								-0.695					-0.397

School name	9. # special facilities	Rank	d	d ²	10. # teachers	Rank	d	d ²	12. Turn-over rate	Rank	d	d ²	13. Rank >30km	Rank	d	d ²
Morrington Island SS	10	26	1	1	4	12.5	14.5	210.25	3	19.5	7.5	56.25	1	6	21	441
Kowanyama SS	2	4.5	21.5	462.25	3	5.5	20.5	420.25	4	23.5	2.5	6.25	1	6	20	400
Quilpie SS	4	16	9	81	2	1.5	23.5	552.25	4	23.5	1.5	2.25	1	6	19	361
Tambo SS	3	10	14	196	2	1.5	22.5	506.25	2	13	11	121	5	24.5	-0.5	0.25
Doomadgee SS	3	10	12	144	4	12.5	10.5	110.25	4	23.5	-0.5	0.25	1	6	17	289
Mitchell SS	3	10	11	121	3	5.5	16.5	272.25	3	19.5	2.5	6.25	3	18.5	3.5	12.25
Capella SHS	3	10	11	121	3	5.5	15.5	240.25	2	13	8	64	6	26	-5	25
Dimbulah SS	3	10	10	100	3	5.5	14.5	210.25	1	4.5	15.5	240.25	3	18.5	1.5	2.25
Tully SS	2	4.5	14.5	210.25	5	22	-3	9	2	13	6	36	2	14	5	25
Emerald SHS	5	21.5	-3.5	12.25	4	12.5	5.5	30.25	3	19.5	-1.5	2.25	4	22	-4	16
Bowen SHS	4	16	1	1	4	12.5	4.5	20.25	3	19.5	-2.5	6.25	2	14	3	9
Inglewood SS	4	16	0	0	3	5.5	10.5	110.25	1	4.5	11.5	132.25	1	6	10	100
Goondiwindi SHS	2	4.5	10.5	110.25	4	12.5	2.5	6.25	2	13	2	4	4	22	-7	49
Stanthorpe SHS	2	4.5	9.5	90.25	5	22	-8	64	1	4.5	9.5	90.25	5	24.5	-10.5	110.25
Biloela SHS	5	21.5	-8.5	72.25	4	12.5	0.5	0.25	4	23.5	-10.5	110.25	4	22	-9	81
Kepnock SHS	5	21.5	-10.5	110.25	5	22	-11	121	2	13	-2	4	1	6	5	25
Bundaberg SHS	6	25	-14	196	5	22	-11	121	2	13	-2	4	3	18.5	-7.5	56.25
Bundaberg North SHS	5	21.5	-10.5	110.25	5	22	-11	121	2	13	-2	4	1	6	5	25
Tooloa SHS	3	10	-1	1	5	22	-13	169	1	4.5	4.5	20.25	1	6	3	9
Lowood SHS	5	21.5	-13.5	182.25	5	22	-14	196	2	13	-5	25	1	6	2	4
Laidley SHS	3	10	-3	9	4	12.5	-5.5	30.25	2	13	-6	36	2	14	-7	49
Rosewood SHS	4	16	-10	100	3	5.5	0.5	0.25	1	4.5	6	36	1	6	0	0
Mitchelton SHS	3	10	-7	49	5	22	-19	361	1	4.5	-1.5	2.25	2	14	-11	121
Wavell SHS	4	16	-13	169	5	22	-19	361	1	4.5	-1.5	2.25	2	14	-11	121
Kelvin Grove SC	1	1.5	1.5	2.25	5	22	-19	361	1	4.5	3	9	3	18.5	3	9
Kenmore SHS	1	1.5	1.5	2.25	5	22	-19	361	1	4.5	-1.5	2.25	3	18.5	-15.5	240.25
Yeronga SHS	5	21.5	-18.5	342.25	4	12.5	-9.5	90.25	1	4.5	-1.5	2.25	1	6	-3	9
Sum of d²				2875				5055				1025				2589.5
n				26				27				27				27
SRCC				0.017				-0.543				0.687				0.210