

‘The teachers give as much as they can, not as little as they can’

Report from SiMERR Tasmania

**Kim Beswick
Natalie Brown**

University of Tasmania

INTRODUCTION

In Tasmania the study aimed to gather information concerning the following research questions:

1. What are the major concerns of Tasmanian parents, teachers and students in rural schools regarding mathematics, science and ICT education?
2. How can the mathematics, science and ICT outcomes of rural Tasmanian students be improved?

In relation to each of these broad questions, common themes among the responses of teachers, parents and students were of particular interest, as were differences that reflected the particular local needs of each of the schools and the differing needs of the various types of schools in rural Tasmanian communities.

Focus group interviews with teachers, parents, and students were arranged at each of four schools. The intention was to have approximately eight participants in each of these groups but this was not always possible, and was particularly difficult in smaller schools with small numbers of staff. At three of the four schools only a few parents participated. A staff member at one of the schools explained that it was always difficult to get parents to come to the school because many families lived relatively far away.

The students who participated were selected by their schools from those whose parents provided written consent for their participation in the study. They were not necessarily representative of the student population. For example, all of the participating students at St. Lawrence College¹⁰ were in Years 11 or 12, and two of the students at another school were related to staff members. At Ashmore District High School (DHS), two of the eight students were in primary grades and each of the secondary grades (7-10) was represented. At Mt. Eden DHS there were three students in each of the primary and secondary sections of the school.

¹⁰ All school names are pseudonyms

THE SCHOOLS

Considerable effort was made to involve schools that were as distant as possible from the major centres of Hobart and Launceston. The four schools that participated represent a range of Tasmanian school types (see Table 5). Two were District High schools, the most common type of school in rural Tasmania. These schools cater for both primary and secondary students, usually K-10, but with limited provision for students in Grades 11 and 12 in the more isolated contexts. Such provisions tend to be vocationally-oriented rather than being designed to prepare students for university study. The K-12 school in this study, Ashmore DHS, is located in arguably the most remote area of the state, where the local economy is underpinned by mining but with increasing reliance on tourism. The other District High school, Mt. Eden, is rather less remote but with its catchment area including parts of Tasmania's central highlands. Mossvale Primary is one of very few 'stand alone' primary schools that exist relatively distant from a major centre. Separate secondary schools are also unusual in remote areas. The secondary school in this study, St. Lawrence College, was located on the north west coast in an area that could be described as rural but the school is arguably the least remote of the four by virtue of being situated in a large town, although further from Hobart or Launceston than either Mossvale Primary or Mt. Eden DHS. St. Lawrence College was also the only non-government school involved in the study and the only school in which several of the participating teachers had mathematics or physics majors. Differing local factors, as well as the differing structures of the schools, meant that each faced unique challenges in meeting the educational needs of students in mathematics, science and ICT.

Table 5. Schools and focus group participants

School	Sector	Type	MSGLC Category	Student population	No. Teachers	No. Parents	No. Students
Ashmore DHS	Government	District High (K-12*)	3.1 Remote	295	4	2	8
St. Lawrence College	Catholic	Secondary (7-12)	2.1.1 Provincial City	666	6	7	7
Mossvale Primary	Government	Primary (K-6)	2.2.2 Provincial Area	59	5	4	5
Mt. Eden DHS	Government	District High (K-10)	2.2.2 Provincial Area	98	3	3	6

*Years 11 and 12 offerings limited, mainly VET

FINDINGS FROM TEACHERS

Reasons for teaching in rural Tasmania

A total of 18 teachers participated in focus group interviews. Table 6 shows their responses when asked where they had lived previously. More than 80% had lived in Tasmania all of their lives with approximately half of these describing themselves as coming from a part of the state outside the major centres of Hobart and Launceston.

Table 7 shows the approximate number of years for which 14 of the teachers had lived in the area in which they now worked. Almost half had lived in the area (and taught at the school) for less than one year and, of these, at least half were in their first year of teaching. In fact, with the exception of two of these teachers who had recently moved to St. Lawrence College

from interstate, the number of years in the area and length of teaching experience were essentially the same.

Table 6. Where teachers had lived previously (n=18)

This area	4 (22%)
Hobart or Launceston	8 (44%)
Other area of Tasmania	3 (17%)
Capital city outside Tasmania	2 (11%)
Rural/regional outside Tasmania	1 (6%)

Table 7. Length of time in area (n=14)

Less than 1 year	6 (43%)
1-2 years	2 (14%)
2-3 years	2 (14%)
5-10 years	1 (7%)
10-20 years	1 (7%)
20-30 years	1 (7%)
More than 30 years	1 (7%)

Table 8 shows the reasons given by 15 of the teachers for teaching in their present schools. The Tasmanian Department of Education (DoE) offers scholarships to a small number of teacher education graduates each year. Acceptance of a scholarship means a three year assignment to a relatively hard-to-staff school followed, subject to satisfactory performance, by permanence. In addition, scholarship holders are entitled to transfer to an area of their choice at the end of the three year contract. All three of the teachers who indicated they had taken up their current positions as a result of scholarships were in Ashmore DHS. The opportunity to take up a permanent position, other than via a scholarship, was the reason given by one third of the teachers. One teacher, who professed to liking a rural environment, had been motivated to move from interstate by cheaper land prices and had sought out a similar school to that in which he had worked prior to the move. The other teacher who had recently moved to Tasmania had done so as something of an adventure and lifestyle change.

Table 8. Reasons for teaching here (n=15)

DoE Scholarship	3 (20%)
Permanent position	5 (33%)
Came with partner	3 (20%)
Liked rural environment	1 (7%)
Already in the area	1 (7%)
Closer to home	1 (7%)
Life change/adventure	1 (7%)

Table 9. Predicted length of stay (n=16)

0 years (commute from Hobart or Launceston)	3 (19%)
1 year (then commute)	1 (6%)
Probably less than 3 years	1 (6%)
3 years	3 (19%)
Possibly 4 years	1 (6%)
Unsure	2 (13%)
Indefinite	5 (31%)

Sixteen teachers responded to the questions about how long they expected to stay in their current school, and their responses are summarised in Table 9. Just under one third of the teachers indicated that they had no plans to leave. Three of these teachers were at St. Lawrence College and one at each of Mossvale PS and Mt. Eden DHS. All five were long-term residents of the respective areas; all three of the teachers who had indicated that they came to the area with their partner were in this category. Coming to the area with her partner and obtaining permanency were both relevant for Susan. In her words:

When I finished teachers college, St Lawrence were advertising for maths/science teachers and my husband and I both applied and we both got positions. We both were given permanency within 12 months and the Education Department weren't offering permanency so we have been here ever since, which is 20 years. (Susan, secondary teacher, St. Lawrence College)

Of the three scholarship holders, one indicated that he would consider staying for a fourth year, one was planning to leave after the required three years, and the third was considering forsaking permanency in order to leave before serving three years. Three teachers (two at Mossvale Primary and one at Mt. Eden DHS) had not moved from their homes in Hobart or Launceston. The distances commuted would have been between 80 and 120 km each way. One secondary teacher at Mt Eden DHS was planning to move back to Hobart for the next year and commute: 'It's too boring here for a young teacher to stay overnight.' His colleague who was already commuting said:

It is not easy. It is a bit time wasting. It does add extra time to your day and you get tired from doing it but you can do it. (Dean, Mt Eden DHS)

In summary, teachers at the four schools tended to be relatively inexperienced, motivated to work in a rural school by the prospect of permanent employment, and not expecting to remain long-term in the area. This was particularly the case for teachers at Ashmore DHS. Teachers who had moved to the area with a partner or who had lived in the area earlier were more likely to stay beyond an initial three-year contract. St. Lawrence College was a Catholic school and also located in a relatively less remote area, both of which may have accounted for the relatively older, more experienced staff. This school also advertised nationally and promoted the lifestyle benefits offered by the area.

Strengths of rural/regional schools in helping students achieve their potential in science, ICT and mathematics

The strengths identified by the teachers fell into three categories: availability of resources, knowledge of students, and collegiality.

The availability of resources was mentioned as a strength by teachers in all four schools. Teachers commented on the relative ease of access to computer laboratories (Mt. Eden DHS), the availability of computers in classrooms allowing integration of technology in the curriculum (Mossvale Primary), the high standard of the science laboratories (St. Lawrence College), the availability of a laboratory technician (Ashmore DHS and St. Lawrence College), access to science laboratories for primary classes and hence the relatively greater amount of science teaching in primary grades (Ashmore DHS), and the availability of maths resources via a shared resource room (Ashmore DHS).

Teachers in three of the schools considered factors related to knowing students as individuals as a strength. In Mt. Eden DHS the teachers commented on the benefits of knowing the students' backgrounds and families, and of small classes that enabled individuals to be catered for. One teacher said:

A very big factor would have to be in knowing the students – knowing their backgrounds and being in a small community, you know all their parents or most of them anyway and having a good rapport with the parents too. You are also able to help students individually and set up little programs and it is a lot easier to monitor. (Mary, primary teacher, Mt Eden DHS)

A teacher in Mossvale Primary explained that small student numbers meant that teachers could observe the development of individual students over a number of years, but that it did not always translate into smaller classes as numbers in cohorts fluctuated from year to year. At St. Lawrence College considerable effort was made to assess the abilities of students in order to assign them to an appropriate mathematics syllabus.

Teachers in Ashmore DHS considered the potential (although only partially realised) for close relationships with other schools in the area to be a strength. One teacher pointed to the joint planning that had begun in relation to the mathematics curriculum as an example of what might be possible. Teachers in Mossvale Primary believed that relationships among their small staff were 'positive' and saw this as a strength. Collegiality was also a major strength in the view of teachers in St. Lawrence College. They believed this was evidenced by the rapport and ease of communication among staff members in each of the mathematics and science teams. Teachers in the mathematics area agreed that the very structured mathematics program in the school made it very easy for new staff to 'slot in and carry on with the job'. This was especially appreciated by teachers who were not trained in mathematics or who were inexperienced. One such teacher said:

... making myself more employable, giving myself extra skills. I jumped at the opportunity to have a crack at mathematics ... absolutely fantastic in being mentors and helping me through that, but everything is very structured and very well laid out and it is quite easy to fit in. (Paul, secondary teacher, St. Lawrence College)

Similar comments were made about the science program in St. Lawrence College. Teachers in Ashmore DHS were positive about the willingness of local industry to be involved in the school.

Particular programs and initiatives were mentioned in positive terms in three of the schools. At Ashmore DHS, the Mathematics Relay competition organised in the local area by the Mathematical Association of Tasmania was cited as example of an opportunity to meet teachers from neighbouring schools and for students to enjoy mathematics in a non-classroom environment. A Grade 5/6 teacher had also offered a successful science option for students in those grades. The course had run over 20 weeks and used the science laboratories usually accessed only by secondary students.

St. Lawrence College had a learning enhancement program which allowed a second teacher to be present in some classes, and one science teacher, described by those interviewed as 'very passionate', was the driving force behind an annual science fair which provided an opportunity for students to conduct a small scientific research project. It was also common for teachers of senior grades in St. Lawrence College to offer additional tutorials after school to help motivated students.

The teachers in Mossvale Primary were pleased with the emphasis their school had placed on mathematics in recent years. This had included professional learning workshops and programs and the acquisition of additional resources for mathematics teaching. Teachers at Mt. Eden DHS also mentioned developments in their mathematics program and, in particular, the effectiveness with low achievers of ideas from the collection of booklets entitled *Mental computation: A strategies approach*. A particularly talented group of Grade 1 students were also being offered extended numeracy for a double period on Monday and Wednesday mornings, and a number of both primary and secondary students were involved in an online extension program, *Pegasus*, provided by the Department of Education. The program included interaction with students in other schools and focussed primarily on science but also included some mathematics activities.

Obstacles to helping students in rural/regional schools achieve their potential in science, ICT and mathematics

Teachers in three of the schools identified a lack of subject expertise and the resultant requirement to teach outside subject areas as a major obstacle to their students' progress in mathematics and science. It was identified as a problem in relation to mathematics at Ashmore DHS, science in Mossvale Primary, and both mathematics and science in St. Lawrence College. One teacher, qualified to teach SOSE, but required also to teach Grade 9 and 10 mathematics, described how even the availability of expertise among colleagues does not solve the problem:

Even if [a colleague] had planned something really great, I can't necessarily follow my students' mathematical thinking in the same way that he can. The other day I completely misunderstood a student's strategy and I apologised to him afterwards because I thought I had made him feel stupid but it was just because it was something different and I think that if I was a maths teacher, I would ... it would be better. (Andrea, secondary teacher, Ashmore DHS)

Teaching out of area represented an additional burden for beginning teachers. As one teacher at Ashmore DHS expressed it:

It is certainly very trying ... especially first year out when you have all the battles of just actually surviving first year, let alone teaching 9-10 maths as well. (Simon, secondary teacher, Ashmore, DHS)

The sole specialist mathematics and science teacher in Ashmore DHS, although confident about his mathematics content knowledge, confessed to a lack of pedagogical expertise particularly in relation to teaching mathematics other than from a textbook in Grades 9 and 10. In St. Lawrence College the difficulties confronted by unqualified mathematics and science teachers were linked to the high turnover of staff. One of the recent arrivals at the school commented that he was his Grade 8 science classes' fourth science teacher for the year. The effect of losing experienced staff was described as follows:

It is really difficult because if you get a really good operator in one of those fields specifically and then you lose that person, obviously you are not just losing them but you are losing their knowledge base and they also understand how it works and they have that background knowledge of the students ... (Peter, secondary teacher, Ashmore DHS)

Teachers in two schools were concerned about the low priority given to science. In Ashmore DHS science was not specifically timetabled. In Grades 9 and 10 students were required to choose two half-year investigation units that involved science, but in lower grades the inclusion of science was entirely at the discretion of the teacher with the result that students did no science at all in some grades, including the lower secondary grades.

The teachers at Mossvale Primary were conscious of their lack of expertise in science and commented on the lack of professional learning opportunities in the subject. They also believed that more resources for teaching science would be useful. In fact, although all of the schools identified the availability of resources as strengths, issues related to resourcing were noted by teachers in three schools as obstacles to students' progress.

In Ashmore DHS the teachers identified a need to better utilise the abundant resources they had and to develop a considered plan for the purchase of future resources. A particular lack was noted in relation to non-textbook resources for Grades 9 and 10 mathematics. Although appropriate resources for primary grades were readily available, there was a concern that teachers did not always know how to use them effectively. This problem related to technological resources such as digital cameras, and also to simple items such as counters. In the words of a primary teacher:

We have got kids picking up maths resources and going "What do I do with it?" I think in a lot of cases staff don't really know the best way to use the resources as well ... you can use these little coloured counters to count with, but what else can you use them for? I just don't think it is utilised enough.
(Sam, primary teacher, Ashmore DHS)

Teachers at St. Lawrence College were alone in citing a lack of availability of computer hardware as an obstacle. They referred to the lack of computer laboratories and the inadequate numbers of laptops available for classes to borrow.

Secondary teachers at Mt. Eden DHS considered the greatest obstacle to students' progress to be the wide range of student abilities which was exacerbated by the need in a small school for composite classes spanning up to three grade levels. One teacher stated:

I have got kids who are working at eight different levels, so that is eight lots of stuff I need to prepare and check up on. (Mary, primary teacher, Mt Eden DHS)

Teachers at Ashmore DHS also described their struggle to present a curriculum that satisfied the state requirements, that engaged their students, and also met the needs of the local community. The dilemma they felt is illustrated by the following quotes which also relate to the teachers' concerns about the low priority of science in the curriculum:

We have mining as the major industry within the town and they have a huge need for people who are scientists to work there ... they have a huge need for people who are educated in those fields and if we are not teaching them in those areas, we are actually letting them down and we are not just letting down the students but we are letting down the town itself. (Colin, primary teacher, Ashmore DHS)

I think one of the dangers – talking about teaching them things that are going to be relevant to them as well – every time you bring up the mine or mining in some sort of topic, you are generally met with groans, because they seem to be well and truly sick of it. (Simon, secondary teacher, Ashmore DHS)

Attraction and retention of good science, ICT and mathematics teachers

Attracting and retaining science, ICT, and mathematics teachers was an important issue for teachers in two schools. Teachers in Ashmore DHS believed that over any three year period approximately 80% of the staff leave. Consistent with the reasons given for their own presence in the school, three of the four Ashmore DHS teachers regarded the provision of scholarships and permanency as important incentives for attracting teachers. They also believed that the provision of weekend accommodation, for nominal rent, in the major centres they regarded as ‘home’ would be helpful. They felt employers could do a better job of selling the benefits, in terms of both career opportunities and lifestyle, of working in a rural school. The teachers acknowledged that such measures would be effective for young or beginning teachers and that the attraction and retention of more experienced teachers was a much greater challenge. They saw an answer in the encouragement of more local students to continue their studies, become teachers and then come home. One way they felt that this could be achieved would be to offer scholarships to Grade 10 students. One summarised the message to such students as:

Do your time and then there will be a job here for you. We already know that if you study well, you can do two years in college, four years at uni – in six years time you will be back here. (Sam, primary teacher, Ashmore DHS)

The teachers believed that this would also help to address the relatively low retention rates from Year 10 to Year 11 characterising their school.

One of the Ashmore DHS teachers felt that preparation to teach in a range of subject areas, rather than in a speciality, would make the experience of teaching in rural and remote schools more enjoyable and hence improve the chances of teachers at least completing their contracted times. In particular, she cited the difficulty of teaching mathematics in upper secondary grades with no preparation to do so. Professional isolation and a lack of support staff, in addition to the requirement to teach across a range of subject areas, were also regarded by one teacher at Mt. Eden DHS as a disincentive for mathematics and science teachers to stay in rural areas:

For maths/science teachers to stay here there needs to be more support – externally. It would be great to have someone to help me in science, to get the classes ready, because I have to do it all, and not just in science but for maths, PE, MDT and computers as well. It would be nice to have contact with teachers from other schools, because I have no one to bounce ideas off. (James, secondary teacher, Mt. Eden DHS)

Teachers in St. Lawrence College also believed that employers could do more to sell the lifestyle advantages of teaching in rural areas, and could perhaps include free membership of a local gym or sporting club. They also suggested that more could be done in terms of relocation assistance and remuneration. One of the teachers cited generous financial incentives provided to teachers in some Canadian provinces and another referred to arrangements in other Australian states whereby substantial periods of paid leave are provided to teachers on completion of a requisite number of years of service in particularly remote

locations. They felt that an annual return flight to any Australian capital city would also be attractive and help to overcome the sense of isolation. One of the teachers also mentioned the relative difficulty of pursuing further study in rural and regional areas as a disincentive for teachers coming to such areas. Another commented on the availability of distance courses and on the potential for assistance with HECS costs to motivate some teachers to teach in rural and regional schools. The teachers in St. Lawrence College agreed that increasing the pool of qualified science, ICT and mathematics teachers from which recruits for rural and regional schools could be drawn would be helpful.

One of the teachers who had recently moved from interstate suggested that the two major fears in coming to a rural or remote location were:

a) you are going to hate it and be trapped and it's hard to get out, and b) you are going to miss your family a lot. Now the first one can be overcome by saying to teachers, "Why don't you come and give it a go and if you are unhappy, we will call it quits after six months". (Paul, secondary teacher, St. Lawrence College)

He believed that offering teachers a six months no obligation 'trial' could be effective as this would be time for people to realise the advantages of the situation. It would also encourage more people to consider teaching in rural or remote areas.

Two possibly intractable disincentives for teaching in rural or remote schools were also mentioned. Both were likely to affect relatively experienced teachers more than novices. A teacher at Ashmore DHS described having one's own children attend the school as a potential problem, and an experienced teacher at St. Lawrence College observed that if one does settle into a rural community and remain in a school for many years, one's own children almost inevitably left to pursue their own careers. She regarded the difficulties with teacher retention as part of the broader problem of a lack of opportunities for professionals in rural and remote areas.

Teachers' recommendations

The majority of recommendations related to professional learning opportunities including opportunities to collaborate with colleagues, resourcing, and curriculum issues. Less frequently mentioned recommendations related to class sizes, provision for high and low achieving students, and teacher education.

Teachers in all of the government schools (Ashmore DHS, Mossvale Primary, and Mt. Eden DHS) made recommendations related to professional learning opportunities. Teachers in two schools felt a need for more professional learning in science, with those in Mossvale Primary also nominating ICT as an area in which they would benefit from greater support. The teachers in both these schools were also keen to have more professional learning delivered locally at the school or cluster level. The teachers at Ashmore DHS had been pleased with the support they had received in mathematics from Department of Education personnel. One teacher said:

When our school has said that we have a problem with numeracy and that we need help, he has gone, "Right. I will come up and will run all these Pds", and that has been great. (Sam, primary teacher, Ashmore DHS)

The availability of relief teachers to allow participation in professional learning was a concern to teachers in Ashmore DHS and Mt. Eden DHS. Teachers in Mt. Eden described the

difficulty of getting relief mathematics and science teachers who could actually teach their classes something while those in Ashmore lamented the absence of any relief teachers at all. There was agreement that, after school hours, locally provided professional learning was part of the answer to these issues. Rather than funding teacher relief, the Education Department could fund professional learning providers to come to them for a number of after-school sessions. In the words of Sam:

I am sure we wouldn't mind banking up our professional learning that we have to do after school and do it non-stop in one week after school just to make their time worthwhile coming up here. It would be cheaper for the school to pay for one person to come up and sit here for three days, have a look at the resources and help us out. (Sam, primary teacher, Ashmore DHS)

Several teachers at the three government schools mentioned the benefits to their practice of conversations with colleagues. In particular, teachers in Mossvale Primary believed that more time for collaborative planning would be beneficial. Those in Mt. Eden DHS who commuted to either Hobart or Launceston on a daily basis acknowledged the conflicting problems of difficulties with relief teachers for professional learning in school hours and the demands of commuting after extended hours in the case of after-school professional learning.

Recommendations concerning the curriculum were made by teachers at the three government schools, with most relating to the science curriculum. Teachers expressed a desire to have science more explicitly mandated (Ashmore DHS), more detailed with respect to exactly which scientific concepts they should teach (Mossvale Primary), and more opportunities to involve students in small scientific research projects (St. Lawrence College). Teachers in St. Lawrence College also believed that the time available for the teaching of both mathematics and science had decreased over the years and had made adequate coverage of the curriculum increasingly difficult.

Teachers in Mossvale Primary and Mt. Eden DHS expressed a desire for more resources, with teachers in the former describing a need for greater numbers of more up-to-date computers and more resources for science teaching. These teachers believed that small schools were disadvantaged in terms of resources because funds were allocated according to student numbers.

Other recommendations included a reduction in class sizes together with the provision of additional support teachers to assist with both low and high achieving students in primary classrooms (St. Lawrence College), and greater attention in secondary teacher preparation on curriculum units, particularly mathematics and science. They believed that this would enable new teachers to teach across the range of subject areas that they were often required to in rural and regional schools (Ashmore DHS).

FINDINGS FROM PARENTS

Living in rural communities

With the exception of one who had moved to the area from NSW three years ago, all 15 parents were long-term residents in their communities, having lived locally for at least 15 years and in most cases much longer. Two parents at St. Lawrence College said that they had moved to the area for work, one because of her husband's work, and another because he had married an ex-Tasmanian girl who was keen to 'come home'. One of the parents at Ashmore

DHS anticipated leaving the area in 18 months time because both of her children would be in senior secondary grades or at university by then, and hence studying in Hobart or further afield. None of the other parents had plans to leave.

Mossvale Primary and Mt. Eden DHS were the only schools in their local areas and none of the parents at those schools had considered sending their children further afield for their education. They liked the friendly, family-like atmosphere of a small school and the fact that ‘everyone knows everyone’. One recalled positive experiences he had as a child attending a similar school. All acknowledged that they may have to send their children to Hobart or Launceston for their senior secondary years.

One of the parents at Ashmore DHS had chosen to send her children to the school for both their primary and secondary schooling, whereas the other had chosen the local Catholic school for her children’s primary education. Her husband’s Catholicism had been a factor in this. Her eldest child had just completed Year 12 at a private school in Hobart where they had extended family. She explained why boarding had been ruled out as an option in earlier grades:

There was always the option of the children going to boarding school. My husband, himself, went to boarding school. He grew up in the north west of Tasmania and boarded from Grade 7 on, but because there was high school here in town I didn’t think it was an option. I would rather have my children here at home but at Year 11, there was no Year 11 option at that stage. There still isn’t – it’s very limited, so he had to go away with all his friends to do Years 11 and 12. (Sarah, parent, Ashmore DHS)

At St. Lawrence College four parents mentioned that either they or their spouses were Catholic and this had influenced their choice of school. One mentioned that it was easier to send children to a school that all their cousins had been to. Of most importance to these parents, however, were factors such as the school’s sound reputation in the local community, particularly its ‘high standards’; the academic, sporting and cultural opportunities they believed it provided for their children; and the values, culture, and family ‘feel’ that they believed the school embodied. One parent expressed the latter in terms of her perception that there would be more children ‘like ours’.

All of the parents were adamant that they did not want their children to be away from family until at least the senior secondary years, and only then if suitable local options were unavailable. A parent at St. Lawrence described the importance of family:

I think most education begins at home. We expect teachers to finish it off. We don’t expect teachers to initiate it. Part of a strong family is being involved with each other. We didn’t contemplate sending ours to boarding school. (Bill, parent, St. Lawrence College)

Educational aspirations for their children

All of the parents valued post-compulsory education for their children and mentioned university as either a hope or, less often, an anticipated destination for their child. One parent was hoping her daughter would go to university but was keen for her son to have a trade. Another spoke about her eldest daughter who had spent five years at university but had been unable to find a job in the field she had studied and was now working in Hobart. Another qualified his university aspirations for his children by saying that he saw this as appropriate if they had the ability, and one mentioned concern about the costs involved. A parent at

Ashmore DHS described her concerns for her son's future and, in particular, the lack of local opportunities:

I mean, you worry about your kids. When we left school, jobs were easy to find and now they have to stay at school. They can't just drop out in Year 9 or 10 and walk into jobs and end up bosses and stuff like they used to. It all depends. If Year 11 is here and it is going well then [son] will most likely stay here. But if it doesn't offer him what he needs – because he is talking about going to the Air Force. At least here you can keep an eye on them.
(Cheryl, parent, Ashmore DHS)

The parents at St. Lawrence College agreed that it was important to respect their children's wishes about the choices they made in life, and their priority would be to help them make decisions and to keep their options as open as possible. They were also unanimous in not limiting their thinking about universities to the local institution, saying their choices would depend upon the availability of suitable courses.

Strengths of rural/regional schools in helping students achieve their potential in science, ICT and mathematics

Parents at three of the four schools believed there were advantages in having their children attend a smaller school. In particular, they felt that they knew the teachers and other students better and more of the teachers knew the children well. In two of the schools, smaller class sizes were also seen as a strength. One parent at St. Lawrence College explained that this allowed more opportunities for individual students, more effective and holistic pastoral care and, in the senior secondary grades, greater opportunity for one-on-one interaction with students.

Teachers were mentioned as strengths at two of the schools. A parent at Ashmore DHS said that her eldest child had an excellent mathematics and science teacher who had prepared him extremely well for these subjects at pre-tertiary level. Parents at St. Lawrence College were also very happy with the teachers currently at the school. One summarised their view by saying that, 'the teachers give as much as they can, not as little as they can', and that they encourage the students to do the same. Another mentioned the value of having teachers who had been in the school for a number of years:

They are just good teachers and there is continuity there. They have been there a while and they know every trick in the book and they know how to get the best out of the kids. (Jan, parent, St. Lawrence College)

Maths and science teachers in the senior secondary years were particularly well regarded. The only mention of physical resources was a reference to the quality of the science laboratories at Ashmore DHS.

In terms of special programs they perceived to be valuable, the parents at Ashmore DHS mentioned a science show, possibly run by the CSIRO, that visited the school annually. At St. Lawrence College the science fair was a highlight. The parents described this event as giving students a love of science and an opportunity to apply their learning. They believed it exemplified the valuable links that existed between the school and the wider community. St. Lawrence College parents also mentioned a program that involved senior students working with younger children in mathematics, and involvement in mathematics and science competitions, describing them as worthwhile extension opportunities. Parents at Mossvale

Primary valued the parent help program that provided one-on-one support for children experiencing difficulties, and school farm was mentioned by parents at Mt. Eden DHS.

Obstacles to improving outcomes in science, mathematics, and ICT education

The most commonly mentioned obstacle was summarised by parents at Mt. Eden DHS as the lack of specialist teachers and the consequent requirement for teachers to teach in areas outside their expertise. The issue was mentioned, with slightly different emphases, by parents at all of the schools. At Mossvale Primary this problem was seen as possibly related to the fact that the school was very small and hence there were few teachers, of which none had any particular expertise or interest in science. As one parent expressed it:

I think it is just not pushed for them to do that and being a small school they don't have a wide variety of teachers and if the teachers aren't trained or don't have an interest in science, I think that is the end of it. (Julie, parent, Mossvale Primary)

At St. Lawrence College the parents were aware that the school advertised nationally for teachers and sometimes had no applicants for maths/science positions. They believed the problem affected younger children more because the school deployed the expertise it had in the senior grades. In the words of one parent:

I think it is often hard to actually get specific science and maths trained people, so sometimes we get someone here who is teaching a subject which is their expertise and they have to take a maths class ... I know we have had job applications – like Australia wide – and had no responses. So there is obviously a shortage – I am not saying that 11 and 12 kids are more important, but I guess that is where we tend to put our expertise of teachers if we have to spread people around. (Margaret, parent, St. Lawrence College)

They also connected the shortage of maths/science teachers with the disruptions to students' learning that resulted from having several (up to four) different teachers in a year for a particular subject. They believed that continuity with a given teacher was particularly important in mathematics and science. At Ashmore DHS parents were concerned with the very high turnover of staff, which they estimated to involve up to 50% leaving in a given year (this contrasts with the teachers' estimate of up to 80% of teachers leaving in a year). They saw this as causing a major problem with continuity in terms of expectations of students in the school. As one described it:

You have children who have problems and stuff like that, and the teachers that were here for three or four years know these children and know how to work with them and then you get the new lot – they don't know and all of sudden you have a few kids who are unsettled. You can have probably two in a class and that disrupts the whole class ... (Cheryl, parent, Ashmore DHS)

The parents believed the problem was exacerbated by the high proportion of beginning teachers that came to the school. These were seen as energetic, progressive and enthusiastic, but without experience and coming into an environment where many of them felt terribly isolated. In addition, there were insufficient numbers of experienced staff to guide them and to pass on information about how best to cater for individual children in the school.

Inadequate funding or resourcing was also referred to by the parents at Ashmore DHS, Mossvale Primary and Mt. Eden DHS. At Ashmore DHS there was a perception that the computers were very often not working. The parents were not sure whether this was due to insufficient numbers of computers in the school or to the lack of technical support because of the town's location. The concern at Mossvale Primary was in relation to the lack of science resources that they attributed to the current teachers' lack of interest and expertise in the area. The parents at Mt. Eden DHS explained that their school had recently been reclassified and was now in a category considered less remote and hence eligible for less funding. They regarded this as unfair, pointing out that the school's feeder area extended considerably further from the nearest urban centre than the location of school.

Other perceived obstacles related to particular arrangements or practices in the schools. At St. Lawrence College there was some concern about the amount of time students, particularly seniors, spent out of class involved in such things as inter-school sporting competitions which often entailed significant travel time. The problem was exacerbated by the constraints on the length of the school day that were imposed by the schedules of school bus operators. As one parent stated: 'The education of children depends on the bus timetable!'

At Mossvale Primary the parents expressed concern about their perceived inability to help their children to the extent that they would like to, particularly in mathematics. Two of the four professed to having been very poor at mathematics when they were at school and all lacked confidence in the area. One parent recounted:

My son brought home his maths the other day and I didn't have a clue, and even to look at how they are done – how did they get the answers out of that?
(Anne, parent, Mossvale Primary)

They believed that support should be available to parents, perhaps in the form of notes for parents to accompany homework. In the words of one parent, 'Things have changed since we were at school.' Parents at one school were somewhat unhappy with the extent of support available to children with difficulties and also believed that such difficulties were often identified too late.

A parent at Ashmore DHS believed that children should be taught basic keyboarding skills to improve the efficiency of their use of computers. St. Lawrence College parents expressed concern about the expense of necessarily having to send their children away from home to study at university and at the relative lack, in small communities, of cultural resources such as museums.

Community influences on outcomes in science, mathematics, and ICT education

Parents at two of the four schools mentioned the relative difficulty of finding work in the area as a factor that influenced their children's educational outcomes. At St. Lawrence College the parents believed that the reputation of the school gave their children some advantage in the employment market, but added that most went to Hobart, Launceston or interstate to pursue their tertiary education and careers – to stay would require them to 'lower their expectations'. Most of the parents did not see the need for their children to leave as necessarily a negative. In the words of one parent:

I think we live in a fairly conservative community, and I think it's healthy for the kids to get away – in terms of tolerance and celebrating diversity ... there

is a whole other world out there that they perhaps haven't experienced, or if they have been exposed to it, it has been with a judgmental attitude sometimes. (Stella, parent, St. Lawrence College)

Another St. Lawrence College parent described how growing up in a smaller community gave her children security and hence a degree of confidence, strength and stability that served them well when they went further afield. At Mt. Eden DHS the parents explained that the lack of work in the area meant the community was aging and the school was becoming smaller.

The parents at Mossvale Primary referred to the challenging socio economic environment of the area. This meant that not all families owned a computer or had access to the internet which, in turn, presented equity issues in terms of children's access to resources. In addition they believed that there was too little parental involvement in the school and that many parents simply left their child's education to the teachers.

At Ashmore DHS the parents spoke about the advantages of a small community in terms of developing their children's independence. They saw this as a function of the relative safety of the community and the small distances involved in getting from home to the various sporting and youth venues in the town.

Parents' recommendations

Recommendations from the parents related principally to teachers and ICT resources. Parents at St Lawrence College, Mossvale Primary and Mt. Eden DHS believed that recruiting more specialist teachers in maths, science and ICT needed to be a priority. One parent explained that this was important because teachers of mathematics needed to be able to identify and help students who were struggling, and that ICT teachers should be up-to-date with the field rather than just learning with the students. They saw a need to make teaching mathematics, science and ICT more attractive to young people. Another expressed what was needed in terms of teachers, as follows: 'We need enthusiastic teachers who want to teach those subjects – teachers who are passionate about teaching them.' At Ashmore DHS, the overriding concern was retaining teachers beyond three years in order to provide greater continuity and a better balance of youthful enthusiasm and experience. They described the current incentive package offered to teachers as 'absolutely pathetic'. They also believed that the accommodation offered to teachers was sub-standard and certainly not suitable for a teacher to bring a family to. Sarah described it thus:

They may have been fine when they were built 30 years ago or whenever it was, but in the city they wouldn't be living in that standard of accommodation so why expect them to do that here? ... the young ones put up with it but if you were 30 or 40 or 50 plus and you have got a family, you are not going to bring your family here to sub-standard accommodation. So we are not going to get those mentors if that is the sort of thing we are offering. (Sarah, parent, Ashmore DHS)

Parents at Ashmore DHS, St. Lawrence College and Mossvale Primary believed that students needed to have better access to computers at school. The concern at Ashmore DHS was for increasing the reliability of the computers by improving the servicing arrangements. At St. Lawrence College there was discussion about increasing the numbers of laptops available for students to use in class, possibly by implementing some sort of hiring scheme to which all parents contributed. Concerns about equity underpinned the recommendation of parents at

Mossvale Primary that student access to computers at school in school hours should be increased.

Parents at St. Lawrence College wanted to see more mathematics and science in the curriculum and, in particular, believed that there should be more funding to provide ‘exposure to outside things’ in these areas. This could be achieved either by bringing people in or by taking students on excursions. It should be noted that these parents, and others at government schools, were supportive of the new Essential Learnings curriculum and regarded the willingness of younger teachers to embrace change as one advantage of having relatively inexperienced staff.

FINDINGS FROM STUDENTS

Advantages and disadvantages of living and schooling in rural and regional areas

The majority of students interviewed enjoyed living in rural/regional areas. Many students believed it to be an advantage to live where everyone knew one another. A close community was perceived to be safer, with people watching out for one another. Students at Mt. Eden DHS thought that it was relaxing to live in a rural community and it allowed them to pursue recreational interests such as fishing. In Ashmore DHS the opportunity to procure employment and work experience through the community network was also a positive.

I have lived here forever. It is good. I love [this town] – it is great. Everyone knows each other like [girl] said and it is good that young people can go and get jobs and get experience in the workforce and then go off and use that experience in other places. (Felicity, secondary student, Ashmore DHS)

There were students who expressed some boredom with living in rural areas with ‘nothing to do’, however these were in the minority. Two students saw ‘everyone knowing everything’ as a negative. The inability to easily see your friends when they lived in more geographically isolated areas was also an issue, particularly for the students at Mossvale Primary. Nevertheless, many students stated that they wished to return to the area, or to another rural area following a period of time for study or after experiencing a change. For example, one student said:

I would like to come back and live for a few years but I would like to leave for a few years and see what I really think of it after experiencing a whole lot of other things. (Alison, secondary student, Ashmore DHS)

The presence of family in the district was the main reason cited by those Ashmore DHS students who planned to return to the district. Students from St. Lawrence College were evenly divided, with half wanting to return to the area following completion of their education and the others wanting to move to a larger centre. The lack of facilities in the towns in specialised areas such as the Arts was also raised – students at Ashmore DHS spoke strongly on this issue. Some students travelled to pursue specific interests, but the time and expense involved were seen as major ‘negatives’.

With respect to attending school in a rural or isolated area, students from all schools believed this enabled them to develop more positive relationships with teachers than would be possible in larger centres. Teachers were seen as friendly and people with whom they could talk. That

some teachers were family friends, or had contact with the students out-of-school, was also seen as a positive. Students from Ashmore DHS made reference to the number of younger or graduate teachers that taught at the school. This was viewed positively, with one student commenting:

Like, they can relate – like we feel more comfortable around them because we can relate to them and where they are. They are good. (Felicity, secondary student, Ashmore DHS)

Students from all four schools also believed attending a school with smaller numbers gave them the opportunity for more one-to-one assistance.

Students from St. Lawrence College believed living in a rural area made it easier to be selected for special programs, with the National Science Camp given as an example. However, this was balanced by the greater expense involved in taking part in these opportunities. Tailoring courses to the interests of students, offering VET courses for example, was also seen as a strength.

Time to travel to school was mentioned as a concern for two students; others saw it as an opportunity to socialise with friends. Some students identified their responsibilities on the family farm and in paid employment as encroaching on time that was available for study.

Facilities and equipment were assessed as sub-standard by students in three of the schools. This included science equipment and classroom space. Students from the Government primary school were particularly concerned about the lack of classroom space to enable activities, such as practical science, to occur. They also expressed concern at having to share facilities with younger students. Access to up-to-date computers was also seen as inadequate.

A restricted choice of elective subjects was raised by students in all three schools with secondary classes. In Ashmore DHS this was ameliorated to some extent by the offering of on-line units. Nevertheless, students were less than satisfied with this form of delivery. They felt that lack of a teacher's physical presence adversely affected their concentration and, if they had problems, waiting for a response from a remote teacher often involved lengthy delays and consequently wasted class time. There were also concerns about the reliability of computers. The introduction of the Essential Learnings curriculum had also influenced the range of subjects available to the students at Ashmore DHS. In that school, students have the opportunity to choose three electives, with mathematics and science being among the options. It was not uncommon for students at each of Ashmore DHS, St. Lawrence College, and Mossvale Primary to transfer to a city school in secondary or upper secondary school in order to have a greater choice of subjects.

Aspirations for education and careers

All the secondary students interviewed had quite definite ideas about their future career directions. Students from the Catholic college, all Year 11, had aspirations in the science/mathematics field. The four male students nominated engineering, electronics, aquaculture and physics, with the female students all identifying careers in the health sciences (medicine, pharmacy, nursing and physiotherapy). Health science was also a career aspiration for students in the other two schools with secondary classes, and forensic science was nominated by two students. A further two students indicated interest in obtaining apprenticeships. All these students were aware of the necessary study involved in the pursuit

of these careers and were prepared to move intra- or inter-state in order to complete their education. One explained:

I will go to college in Hobart and then, because there are no forensic science courses offered at uni, I have to go to the mainland and I thought that once I had done that I might come back to Tassie... (Sally, secondary student, Ashmore DHS)

The primary students were less certain of where their futures may lie. However, one intended to continue the family interest in farming. Working elsewhere, including interstate, was seen as a possibility by students in Ashmore DHS and Mossvale Primary, with those in Mt. Eden DHS less certain about moving out of the district.

Reflections on mathematics

Introduction of the Essential Learnings curriculum in Tasmania has seen some alteration to the way mathematics is taught in Government schools. All students interviewed currently studied mathematics, with the secondary students at Ashmore DHS studying both numeracy (as a component of their core studies or 'toolbox time') and mathematics as an elective subject. The latter subject is necessary to meet requirements for pre-tertiary study.

Overall, the students' attitudes to mathematics were positive, with students seeing mathematics as important. One remarked quite simply: 'I like that we know how to do it...' (Michael, secondary student, Mt Eden DHS)

At Ashmore DHS, four of the students interviewed cited mathematics as one of their favourite subjects. These students, together with several of their peers from other schools, expressed a liking for the challenging nature of the subject, the ability to apply mathematics to problems, and the sense of achievement in reaching a solution.

...in doing Maths 4C, it has really challenged me and it is really great because I am not sitting there getting bored. And when I do figure something out it is an achievement and I feel really good about it. (Grant, secondary student, Ashmore DHS)

...when you understand it, you get a warm fuzzy feeling. (Edward, secondary student, St Lawrence College)

Students who had experienced success in the subject were generally affirming of mathematics, however they held some reservations. These concerns related to being insufficiently challenged, needing to wait for other students in the class, or being asked to perform repetitive functions such as repeatedly writing out long methods of calculations.

Clarity of explanations from the teacher was seen as very important, both by students who enjoyed mathematics and those who saw it as important but not particularly enjoyable. Negative comments about secondary mathematics centred around a perceived lack of relevance of the material and not seeing how what was being learnt could be applied. The following are illustrative:

The maths we are doing is pure mathematics and I can't see any practical nature or any way it can be applied in your life. That is making it difficult to study (James, secondary student, St Lawrence College)

Ninety percent of what we learn in senior college seems to be learning it basically to prove we are smart enough to get into university... (Amanda, secondary student, St Lawrence College)

Mathematics was very well received by the primary students at Mossvale Primary – particularly algebra. They could also cite other mathematics they had participated in, including practical activities. Although initially equating mathematics with addition and subtraction, when prompted, students at Mt. Eden DHS also spoke about a broader range of mathematical activities which they had enjoyed. Primary students at Ashmore DHS were quite negative about the subject, finding it neither interesting nor challenging.

Reflections on science

Initial responses to studying science were unanimously positive from each of the school groups. The investigative nature of science was appealing, with students commenting on enjoying experimenting, investigating and looking for evidence. The primary students, who had experienced less science, also commented positively on the opportunity to experiment and to ‘do stuff’. It was this opportunity to do practical activities that was cited most often as a reason for enjoyment of the subject. The ability to apply concepts used in science and to use these as a basis for explaining everyday phenomena was also a common theme in student comments:

In science, one step is already there because you have already seen the things and experienced it before. It is now explaining why. It just takes everyday experiences and just explains it. (Edward, secondary student, St Lawrence College)

Negative experiences of science were essentially divided into three categories. The first concerned a dislike for what was termed theory, which also encompassed note-taking and remembering facts. The second issue, raised mainly in one school, concerned classroom management issues that detracted from students’ ability to complete work. The third issue was that of resourcing practical science, again raised predominantly in one school.

I think the science lab was built in 1978 so our science facilities are pretty much 30 years old, nearly. (Edward, secondary student, St Lawrence College)

Restrictions on subject choice also appeared to impede science, with one student expressing disappointment that it was not possible to study science in combination with his other electives.

Reflections on ICT as a subject

ICT was not taken as a separate subject by any of the students interviewed. Students at Mt. Eden DHS had previously taken this subject as an on-line elective but this had not continued during 2005. Nevertheless, all students said they regularly used ICT as a component of their other subjects. Their comments are included in the following section.

Reflections on using computers in school

The students generally felt they had good access to computers, both in their classrooms and, in the secondary and district schools, in computer laboratories. Computers were used as an integral part of class work, predominantly for Internet research and publishing. Students were confident users and familiar with a range of software applications. The opportunities afforded

by computers to assist research, access online resources and complete a range of different learning activities were appreciated by the students. Students at Mossvale Primary particularly enjoyed using game software in some subjects.

Computer use, however, was not without its frustrations. Problems with machines, including peripherals such as printers, were commonly reported. Speed of computers and the choice of operating platform were also mentioned. The other major issue raised, by the secondary students, was the inability to access many websites due to Internet filters:

They have got Google Images blocked, so if we need a picture for a power point presentation we are doing for assembly or something, we can't...
(Felicity, secondary student, Ashmore DHS)

We can't access things like breast cancer websites and things like that...
(Cassie, secondary student, St Lawrence College)

Almost all students involved in the focus groups had access to computers at home. For the primary students these were predominantly used for games, occasionally being used to complete work from school. The secondary students, although also using them for communication and e-business, reported regularly using them for research. Unrestricted access to websites on home computers was seen as an advantage.

DISCUSSION OF THE FINDINGS

In all cases the teachers, parents and students at the schools presented an essentially coherent view of the needs of students in mathematics, science and ICT. For example, where parents perceived a lack of expertise and interest in science among the teachers at the primary school, the teachers nominated science as an area in which they needed more professional learning opportunities.

The importance of teachers was recognised by each of the groups and parents and students were, with very few exceptions, appreciative of the efforts and expertise of the teachers at their school. Both teachers and parents recognised the need for teachers to have expertise in the subjects they are required to teach and were aware of the difficulties of recruiting qualified mathematics and science teachers which were exacerbated by being in relatively remote areas. They agreed that the current incentives offered to teachers to work in remote locations were inadequate and particularly so in the case of more experienced teachers with families. At Ashmore DHS, where this problem was most acute, the parents displayed considerable empathy for the plight of young teachers sent to their school and were far more forceful than the teachers in expressing their dissatisfaction with incentives that were provided and, especially, with the standard of accommodation provided for teachers.

The requirement to teach outside a subject area was a major concern for teachers and was also mentioned as less than ideal by some parents. Although one teacher (at St. Lawrence College) saw the requirement to teach mathematics while not qualified as an opportunity that would improve his employability, teachers elsewhere were more likely to regard it negatively. It may be relevant that St. Lawrence College was the largest of the four schools and unique among them in having very experienced and well qualified staff in subject leadership positions. Teachers at this school were very positive about the mentoring available to them and the structured mathematics and science programs that were in place at the school. This difference

highlights the importance of a balance of novice and experienced teachers in a school and the need for subject expertise at least at a leadership level.

The teachers were keen to be involved in professional learning to increase their expertise in mathematics, science and ICT, but also acknowledged the difficulties of accessing such opportunities when some commuted long distances from home to school each day and where relief teachers were extremely difficult to find. It is apparent that models of professional learning delivery that are effective in urban areas are not effective in rural and remote areas. There is clearly a need to explore different and innovative ways to meet the professional learning needs of teachers in rural and remote areas.

The contributions of individual teachers were mentioned by teachers, parents and students. For some parents satisfaction with the school seemed largely related to their perceptions of a single outstanding teacher. Highly valued programs such as the annual science fair at St. Lawrence College and the primary science elective at Ashmore DHS were the result of the commitment of particular teachers. In schools where the turnover of staff was relatively high, such programs were clearly at risk.

Parents and students were more concerned than teachers about ICT issues with the focus of their concerns relating to access and reliability. Although parents acknowledged that the internet was an important way of helping to overcome some of the disadvantages of isolation in terms of accessing resources and obtaining a broader view of the world, they did not see this as a substitute for having people actually come to the school or for providing opportunities for students to visit larger centres. Students also had reservations about the effectiveness of online learning and expressed a preference to interact with a teacher face-to-face.

Parents and students were united in their appreciation of the benefits of living in small communities that were perceived as relatively safe and nurturing environments. Parents were keen to see their children realise their potential in terms of education with the vast majority including university study among their hopes for their children. The students had similar aspirations and both parents and students valued family and regarded living at home as a priority. Nevertheless, there was universal acknowledgement of the need, at some stage, for children to leave home in order to pursue their education and/or careers.

SUMMARY OF THE FINDINGS

In this section each of the research questions that guided the Tasmanian study are addressed in turn. It is recognised that these conclusions are based upon the responses of a small group of teachers, parents and students and need to be seen in this context. The first research question was:

1. What are the major concerns of Tasmanian parents, teachers and students in rural school regarding mathematics, science and ICT education?

A major concern of teachers and parents was the need to attract and retain suitably qualified teachers in mathematics, science and ICT. Teachers were also concerned about access to professional learning. Parents and students were concerned about insufficient access to, and the reliability of computers in their schools. These concerns were expressed, albeit with varying emphases, across the various school types and regions included in the study.

2. How can the mathematics, science and ICT outcomes of rural Tasmanian students be improved?

Responses to this question concentrated mainly on the means of providing more and better qualified teachers and the means by which their continuing professional development may be ensured.

In relation to attracting and retaining qualified teachers in mathematics, science and ICT in rural and remote schools, the evidence from this study suggests that:

- a. The pool of suitable qualified teachers in these subject areas from which teachers can be recruited to work in rural and remote locations needs to be increased.
- b. Current incentives to attract and retain teachers in rural and remote areas are inadequate and need to be substantially improved. In particular, incentives likely to be attractive to more experienced teachers who may have families need to be considered. Suggestions from focus group participants included the following:
 - i. Substantial salary differentials favouring service in isolated areas
 - ii. The provision of low cost weekend teacher accommodation in major centres
 - iii. Upgrading of teacher housing, particularly that provided for families
 - iv. The provision of regular airfares to an Australian capital city of choice
 - v. Short trial periods with ready ‘escape’ options for teachers open to the possibility of working in these areas but afraid of being ‘trapped’
 - vi. Greater effort in selling the lifestyle benefits of living in rural and remote locations
 - vii. Raising awareness of the availability of distance options for further study.
- c. There is some evidence that, in the short term at least, teacher education should include more curriculum studies in these subject areas and, in particular, mathematics, as an acknowledgement of the realities faced by beginning teachers in rural and remote areas.

In relation to the provision of professional learning for teachers in rural and remote locations, the findings of this study suggest that:

- a. It needs to be recognised that professional learning delivery models that are effective in urban contexts are often inappropriate for rural and remote locations. Important differences include:
 - i. The difficulty of finding relief teachers in rural and remote areas
 - ii. The increased time spent away from school necessitated by travelling to attend professional learning in larger centres
 - iii. The time constraints imposed by extensive commuting to and from some schools by some teachers.

- b. Sending experts to isolated areas to provide professional learning on-site, either during school time or after school hours over a series of days, is likely to be effective, and has been welcomed where it has been offered.
- c. Teachers in rural and remote Tasmanian schools are likely to be inexperienced, to have less access to mentoring and to be in contexts where there is limited continuity in terms of programs and expectations. As a result, they need more professional learning opportunities than teachers elsewhere. Encouraging more experienced teachers to work in rural and remote areas would help to address this need.

In relation to concerns raised specifically about ICT, the findings of this study suggest that:

- a. ICT, and in particular, access to online resources, is important for students in rural and remote areas but should not be seen as replacing the need for suitably qualified teachers.
- b. There is a perception among parents and students in rural and remote Tasmanian schools that greater access to computers and to the Internet is essential.
- c. Reliability of computers is a major issue which could possibly be addressed by the provision of local technical expertise and support or the provision of additional hardware.