



Review of Auditor-General's Report 2: 2013-14 Supply of specialist subject teachers in secondary schools

Report No. 34
Education and Innovation Committee
May 2014

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Chair	Mrs Rosemary Menkens MP, Member for Burdekin
Deputy Chair	Mr Ray Hopper MP, Member for Condamine
Members	Mr Steve Bennett MP, Member for Burnett Mr Mark Boothman MP, Member for Albert Mrs Yvette D'Ath MP, Member for Redcliffe Mr Michael Latter MP, Member for Waterford Mr Neil Symes MP, Member for Lytton
Committee staff	Ms Bernice Watson, Research Director Ms Emily Booth, Principal Research Officer (to 1 May 2014) Ms Melissa Salisbury, Principal Research Officer (from 12 May 2014) Ms Carolyn Heffernan, Executive Assistant
Contact details	Education and Innovation Committee Parliament House George Street Brisbane Qld 4000
Telephone	+61 7 3406 7363
Fax	+61 7 3406 7070
Email	eic@parliament.qld.gov.au
Web	www.parliament.qld.gov.au/eic

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Abbreviations and definitions

ACOLA	Australian Council of Learned Academies
COAG	The Council of Australian Governments
The committee	The Education and Innovation Committee
C2C	Curriculum into the Classroom
The department	Department of Education, Training and Employment
DETE	Department of Education, Training and Employment
GTGR	Great teachers = Great results
QAO	Queensland Audit Office
QCT	Queensland College of Teachers
STEM	Science, technology, engineering and mathematics
TIMSS	Trends in International Mathematics and Science Study

Chair's foreword

On behalf of the Queensland Parliament's Education and Innovation Committee I am pleased to report on the committee's consideration of Auditor-General's Report 2: 2013-14 *Supply of specialist subject teachers in secondary schools*.

A performance audit looks at the performance of public sector entities to assess how effectively, efficiently and economically their objectives are being met. In this case, the performance audit considered how effectively the Department of Education, Training and Employment attracts and places specialist subject teachers in secondary schools to maximise student academic outcomes.

While a number of issues were identified that impact upon the department's ability to attract and place specialist subject teachers, the committee notes that these issues are not limited to Queensland and that the department is implementing a number of actions to address them.

The committee will continue to monitor the department's progress towards implementing the five recommendations made by the Auditor-General, and agreed to by the Director-General, as it considers that these will assist in providing improved academic opportunities for students in Queensland schools.

On behalf of the committee I would like to thank the Queensland Audit Office staff and Department of Education, Training and Employment staff who briefed us, and our secretariat staff for their assistance.

I commend the report to the House.

A handwritten signature in black ink, reading "Rosemary Menkens". The signature is written in a cursive style with a large, sweeping initial 'R'.

Rosemary Menkens MP
Chair

May 2014

Recommendations

Recommendation 1

2

The committee recommends that the House notes the content of this report.

Recommendation 2

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The committee recommends that the Minister for Education, Training and Employment tables a report in the Parliament on the department's progress towards meeting the Auditor-General's five recommendations contained in his Report to Parliament 2 for 2013-14, *Supply of specialist subject teachers in secondary schools*, by March 2015.

1. Introduction

The Education and Innovation Committee (the committee) was established by resolution of the Legislative Assembly on 18 May 2012, and consists of government and non-government members.

Portfolio committees support the Parliament to fulfil its functions. A key function of the Parliament is to hold the government to account. One way that committees support this function is by considering the integrity, economy, efficiency and effectiveness of the government's financial management by examining government financial documents and considering the annual and other reports of the Auditor-General.¹ Committees then report back to the Parliament on their considerations, informing debate and ultimately, the decisions of the Parliament.

1.1 Role of the Auditor-General

The role of the Auditor-General is provided in the *Auditor-General Act 2009* (the Act) and includes conducting performance audits of public sector entities and audits of performance management systems of government owned corporations.²

The Auditor-General may prepare a report on any audit conducted under the Act and table it in the Legislative Assembly. Standing Orders require that the Committee of the Legislative Assembly refer an Auditor-General report to the relevant portfolio committee as soon as practicable after it has been tabled.³

1.2 Review process

Auditor-General Report 2: 2013-14 *Supply of specialist subject teachers in secondary schools* (the Auditor-General's report) was tabled in the Legislative Assembly on 15 October 2013 and referred by the Committee of the Legislative Assembly to the Education and Innovation Committee for consideration on 19 November 2013. The committee has reviewed the Auditor-General's report, including the response from the Department of Education, Training and Employment (the department).

A private briefing by staff from the Queensland Audit Office (QAO) was provided to the committee on 22 July 2013. This briefing was held before the Auditor-General's report was tabled as the issues identified as the audit progressed were of relevance to the committee's inquiry into the assessment methods used in senior mathematics, chemistry and physics in Queensland schools. The committee's report on that inquiry was tabled in August 2013.^{4, 5}

To further inform the committee, QAO provided a second private briefing on 20 November 2013, and department officials briefed the committee on 5 March 2014.

¹ [Parliament of Queensland Act 2001](#) s94(1)(a)

² [Auditor-General Act 2009](#) s37A and 38

³ [Standing Rules and Orders of the Legislative Assembly](#), 194B

⁴ As provided under s53(3)(a) of the *Auditor-General Act 2009*

⁵ Education and Innovation Committee, Report no. 25. *The assessment methods used in senior mathematics, chemistry and physics in Queensland schools.*
<http://www.parliament.qld.gov.au/documents/committees/EIC/2013/QldAssessment/rpt-025-14Oct2013.pdf>

1.3 Audit overview

The performance audit examined “... how effectively the Department of Education, Training and Employment attracts and places specialist subject teachers in secondary schools to maximise student academic outcomes”.⁶ Supply and demand of specialist subject teachers across subject areas was examined, with a focus on maths and science, where a shortage of teachers has been identified.⁷

The audit involved analysis of the department’s human resource databases, workforce plans, scholarship programs and pre-service teacher education enrolments. Seven state secondary schools were visited by auditors, and videoconferences were held with an additional two. A paper based survey was distributed to secondary principals in Queensland, and interviews were conducted with the department’s workforce modelling unit.⁸

1.4 Summary of key findings

The audit report acknowledges that there is a shortage of specialist subject teachers, particularly in STEM subjects:

Overall, the supply of secondary school teachers matches demand. However, when considered by specialisation, there is a shortage of secondary mathematics, science and industrial design and technology teachers and an oversupply of primary school teachers and of secondary physical education and music, drama and dance teachers.⁹

The report also found inadequate data about teachers’ qualifications and competencies made it difficult for the department to place appropriately qualified teachers in the schools that require them, and to plan for future demand.

As a consequence of the shortage, and exacerbated by the process by which teachers are allocated to schools, a large proportion of teachers teach subjects outside their field of expertise; and some schools cannot offer subjects due to the lack of specialist teachers.

The audit concluded that the department could be more effective in attracting and placing specialist subject teachers in secondary schools to maximise the academic outcomes of students.

Five recommendations were made by the Auditor-General, which are considered in section 2.4 of this report. The Director-General agreed to all five.¹⁰

The committee makes three additional recommendations in respect of this matter, as detailed throughout this report.

Recommendation 1

The committee recommends that the House notes the content of this report.

⁶ Auditor-General’s Report 2: 2012-13 *Follow-up of 2010 audit recommendations*, p8

⁷ Ibid, p1

⁸ Ibid, p8

⁹ Ibid, p1

¹⁰ Ibid, p42

2. Examination of the report

The objective of the audit was to examine how effectively DETE attracts and then places specialist subject teachers in secondary schools, to maximise academic outcomes for students. Implicit in the audit's objective is the premise that there is a causal link between teaching by teachers who have specialist qualifications in the subject area, and good academic outcomes.

The audit report's focus on specialist teaching in mathematics and science reflects the demonstration that there is a shortage of specialist teachers teaching mathematics, science, industrial design and technology. It also reflects concerns being expressed at a national and international level about the shortage and the impacts, given the importance of these disciplines for future social and economic growth in a knowledge and technology economy.

Following the performance audit the Auditor-General concluded that, while overall secondary teacher supply meets demand, there are not enough teachers with mathematics and science qualifications in Queensland schools and that this has *"... an adverse impact on academic achievement."*¹¹

The audit report uses student performance in the Trends in International Mathematics and Science Study (TIMSS) test as an indicator of academic outcomes, and reports on research linking teachers with specialist qualifications with higher performance on that test and another international test, the Programme of International Assessment (PISA).

The audit report indicated that the performance of Queensland students in mathematics and science has:

*...not improved since 1995 and remain[s] below the achievement of the other mainland eastern seaboard states and territories and also below that of comparable countries. Over this period, student participation rates in senior mathematics and science also substantially declined. The correlation between these two metrics indicates they have a common underlying cause; the most likely cause is the shortage of adequately qualified teachers, especially in mathematics and science.*¹²

A key finding of the audit was that data availability and integrity is impacting on the effectiveness of both the supply and placement of specialist subject teachers.

The committee has considered the audit report in terms of firstly, the findings relating to the supply of specialist subject teachers; and secondly, the findings about the placement of specialist subject teachers in secondary schools.

The committee also considered the actions underway in Queensland to implement the recommendations of the audit report, and address the issues identified.

2.1 Supply of specialist subject teachers

Research highlights a desirability *"... for teachers to teach the subjects in which they have gained their degree."*¹³ For example, a Australian Council of Learned Academies (ACOLA) report identified that countries which perform strongly on indicators which measure science, engineering and

¹¹ Ibid, p16

¹² Ibid, p11

¹³ Ibid, p16

mathematics skills expect teachers of those subjects to be fully qualified in their discipline and to teach in that field alone.¹⁴ That report concluded that the *“the incidence of teaching out of field for mathematics and science in Australia, especially in regional and rural areas, is of grave concern.”*¹⁵

The term ‘teaching out of field’ means that a teacher is teaching a subject in which the teacher has no formal tertiary qualifications.

A lack of specialist subject teachers, resulting in teachers ‘teaching out of field’ is not an issue unique to Queensland schools. In the briefing it provided to the committee, the department noted that:

*There is considerable data and research that indicates that challenges in relation to teacher quality and supply, especially for specialist teaching areas, exists internationally in most developed countries and in other states and territories within Australia. The Australian context was captured recently in a report prepared by the Productivity Commission on the school workforce which was requested by the Australian government on behalf of COAG [the Council of Australian Governments]. The Productivity Commission report found that across Australia there are ongoing imbalances in the supply and demand of different groups of teachers, with persistent surpluses of general primary teachers in metropolitan areas and at the same time shortages persisting in certain secondary subject disciplines and more difficult to staff geographic locations.*¹⁶

Further the ACOLA report highlighted:

*Where there are labour market shortages in specialist science, mathematics and technology secondary school teaching positions, government and Catholic schools in particular are resorting to the use of under-qualified or unqualified replacement staff, in terms of disciplinary qualifications. Teaching outside field is a serious weakness in Australian schooling.*¹⁷

2.1.1 The Queensland context

Whilst the term ‘teaching out of field’ usually means that a teacher is teaching a subject in which they have no formal tertiary qualifications, the indicator for formal tertiary qualifications used in the audit is whether or not the teacher has a major in that subject.

Secondary teachers in Queensland specialise in subject areas during their university studies, which includes both subject content knowledge and specific teaching skills required for that subject.¹⁸

The Auditor-General’s report notes that *“Queensland secondary teachers train in two complementary subjects so they are able to teach more than one area; for example, English and history, or mathematics and chemistry.”*¹⁹

¹⁴ Australian Council of Learned Academies, *STEM country comparisons: International comparisons of science, technology, engineering and mathematics (STEM) education*, final report, p15

¹⁵ Ibid, p48

¹⁶ *Hansard transcript, public briefing*, Department of Education, Training and Employment, 5 March 2014, p3

¹⁷ Australian Council of Learned Academies, *STEM country comparisons: International comparisons of science, technology, engineering and mathematics (STEM) education*, final report, p49

¹⁸ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p16

¹⁹ Ibid, p1

Data indicates that Australian students are more likely to be taught by a teacher without a specialist qualification than the international average:

*In the 2011 cycle of TIMSS [Trends in International Mathematics and Science Study], 34 per cent of Year 8 Australian students who participated in the test had an out of field mathematics teacher, while internationally the average was 12 per cent.*²⁰

Acknowledging significant data shortfalls, the audit report reported that 2010 DETE data indicated that 12.5 per cent of senior mathematics B teachers (ie year 11 and 12) and 36.5 per cent of junior mathematics teachers (ie year 8 – 10) did not have a tertiary qualification in maths. The result is that “not all students in Queensland have the opportunity to learn from qualified and experienced teachers in specialist subject areas ...”²¹

The 2010 DETE data also indicates that approximately 24 per cent of permanent secondary teachers taught at least one subject out of field. Of mathematics teachers at the secondary schools visited by QAO auditors, a much higher proportion - 49 per cent – were found to be teaching out of field.²² There appears to be a greater likelihood of teachers without a mathematics major teaching in regional, rural and remote areas than in cities. At the briefing the QAO auditors advised the committee that an extract of the department’s data in 2013 showed that “... 60 per cent of junior maths teachers in metropolitan or provincial city areas did not have a maths major ...”²³ This figure increases to 69% in regional, rural and remote schools.²⁴

At the public briefing, the department advised that:

*This is an area of our operations that has been the focus of considerable effort and action within the department over many years. We know from research that the importance of having capable, knowledgeable and committed teachers in our classrooms to support and drive student learning outcomes is a key responsibility of the department ...*²⁵

Action taken by the department to address the issue of supply of specialist secondary teachers includes supply and demand analyses and recruitment strategies:

*DETE has undertaken comprehensive supply and demand analyses and workforce snapshots in 2005, 2007, 2010 and 2012 ... and we are currently in the process of implementing a 2014 report. The QAO report provided us with the added opportunity to look at this work through the lens of a performance audit framework. So over the last decade we have used a whole range of attraction, retention and renewal strategies to ensure that schools have quality staff who are able to meet the needs of their student population in their local school context. During this time we should also remember that the curriculum, teaching pedagogy and learning technologies have also been changing and evolving.*²⁶

Additional strategies implemented by the department are considered in section 2.2.

²⁰ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p3

²¹ Ibid, p16

²² Ibid, p3

²³ *Hansard transcript, private briefing*, Queensland Audit Office, 20 November 2013, p4, published with permission

²⁴ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p20

²⁵ *Hansard transcript, public briefing*, Department of Education, Training and Employment, 5 March 2014, p2

²⁶ Ibid

Committee comment

The QAO set itself a challenging task with this performance audit. Student academic outcomes are influenced by so many factors, many of them inter-related, that to focus on the contribution of just one – the supply and allocation of specialist subject teachers – requires a very carefully defined scope.

The value of a performance audit is that it takes a systematic approach to considering progress towards a specific objective through a lens of efficiency, effectiveness and economy. To do this, the audit had to define its indicators for student academic outcomes, and then show that there were links between the supply of specialist subject teachers and performance against those indicators. The audit does this by reporting on the existing body of research.

The committee notes the research cited in the audit report which identifies key aspects of teaching that have been shown to improve learning, including teachers' knowledge of the subject itself, and of how best to teach that subject; and the research which identifies features of teaching in countries with strong performances on the international mathematics and science tests, such as that they focus on disciplinary content rather than generic programs.²⁷

While teaching by specialist subject teachers appears to be a factor contributing to how well Queensland students perform in the TIMSS, as the committee noted in its assessment inquiry report, and as the research demonstrates, there are a large number of other factors which might be influencing achievement levels and participation rates for mathematics and science in Queensland. Some of these factors exist across Australia and in many other developed nations, including a limited availability of specialist subject teachers – which of course is also a product of students studying those subjects at senior level and going on to study them at university.

Some factors are unique to Queensland, such as school starting ages, approaches to teaching, learning and assessment, and the geographically diverse nature of the Queensland population, which can create differential educational resources. Queensland's performance in the TIMSS, which is "*slightly below New South Wales, Victoria and WA*" could reflect some of those unique factors. That comparative performance is also consistent with Queensland students' performance in the National Assessment Program – Literacy and Numeracy (NAPLAN) tests across other subject areas.

The audit report, with the data it presents on teacher qualifications, defines 'teaching out of field' as where a teacher of a subject does not have a major in that subject in their university degree. The committee notes that given Queensland teachers train in two complementary subjects so that they can teach in more than one area, not having a major in mathematics does not necessarily mean that teacher has not completed a tertiary course of study in mathematics as part of their degree.²⁸ Data at anything below the major level, however, is not available (and even data at the major level is unreliable); so this cannot be ascertained. It is the lack of reliable data that underlies many of the issues identified in the audit report.

During the Education and Innovation Committee's 2013 inquiry into the assessment of senior mathematics, chemistry and physics in Queensland schools, committee members heard that one key

²⁷ Grattan Institute, 2012, cited in Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p16

²⁸ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p7

determinant of student subject choice at the senior secondary level is *“the intrinsic interest and enjoyment they gained from studying them in junior years.”*²⁹ Consistent with this view, we noted that the Australian Industry Group (AIG) has called for *expanded engagement in STEM skills at primary schools where students first encounter these areas.*³⁰ The committee’s report also noted research by the Australian Council for Educational Research (ACER) which indicated that:

*The experience of science and mathematics learning in primary and lower secondary school is relevant to a consideration of participation in science, technology, engineering and mathematics. Those experiences can establish the sense of competence that students have in the foundations of mathematics and science and can kindle their interest in science-related fields.*³¹

This finding is strengthened by research undertaken as part of the Longitudinal Survey of Australian Youth, which found a:

*... strong relationship between Year 9 achievement and tertiary entrance performance ... students in the highest Year 9 achievement quartile having the highest median [tertiary entrance rank] score, and students in the lowest Year 9 achievement quartile having the lowest median tertiary entrance rank score.*³²

As identified by the committee in its assessment report:

Our society and economy is increasingly technology-driven, and the knowledge and skills to drive innovation and creativity [are] vital for social and economic participation.....

*Mathematics, chemistry and physics are not the only, or even the primary, subjects which promote development of knowledge and skills to drive innovation and creativity. However there is a strong relationship between these subject and technological growth.*³³

Recent reports of a shortage of students studying information and communication technologies at school highlight this issue:

*Australian businesses can't find enough specialist programmers and digital designers among the Australian population because the seeds for such careers are not being effectively sown in school. If we are to inspire school students to consider these careers, several obstacles must be overcome.*³⁴

The author of the article from which the above quote is taken goes on to note that the description of a proposed national digital technologies curriculum will provide a *“once in a generation opportunity to reboot ICT education”*. The article, like the Productivity Commission report, also notes the challenge of attracting people with specialist subject qualifications into teaching, when other professions offer much more attractive remuneration.

²⁹ Quote from submission, Education and Innovation Committee, Report no. 25, *The assessment methods used in senior mathematics, chemistry and physics in Queensland schools*, p38

³⁰ Ibid, p54

³¹ ACER, 2008, *Participation in science, mathematics and technology in Australian education*, p23 (cited in EIC Report 25, p51)

³² Marks, McMillan and Hillman, 2001, *Tertiary entrance performance: the role of student background and school factors*, Research Report 22 (cited in EIC report 25, p51)

³³ Education and Innovation Committee, Report no. 25, *The assessment methods used in senior mathematics, chemistry and physics in Queensland schools*, p11

³⁴ Grover, David, *Reboot ICT teacher training to halt the computing brain drain*. The Conversation, 9 May 2014

The number of teachers in Queensland that are teaching outside their area of speciality is of concern to the committee. The potential for this to affect the academic achievement and subject choices of students, and the individual, social and economic impacts of those choices, particularly with respect to mathematics and science, appears to be clear.

In addition to negative impacts on students' academic outcomes, the survey of secondary principals completed as part of the audit found that 39% reported "... *there were subjects that they could not offer [at all] due to a shortage of specialist subject teaching staff.*"³⁵

This has significant implications for equity of educational outcomes within Queensland, with the more difficult to staff rural, regional and remote areas, along with some schools which have a low socio-economic status student profile apparently facing greater difficulty in attracting the limited supply of qualified teachers. An adequate supply of special needs teachers is also challenging.³⁶ Students in these areas can be significantly disadvantaged in terms of access to specialist teachers, and having the opportunities to study some of those subjects at all.

We understand, too, that teaching out of field can have a negative impact on teachers themselves. During our assessment inquiry, committee members heard that considerable levels of stress were being experienced by some teachers who felt under-equipped to teach the content they were required to teach.³⁷ We note that the Queensland Studies Authority has recently established a consolidated on-line assessment 'hub' which will support teachers who are teaching mathematics, chemistry and physics out of field, and we welcome this initiative.³⁸

Reduced participation and achievement levels in these subjects at the senior school and university level obviously impacts on the supply of specialist subject teachers into the future.

The department's 2014 workforce snapshot report may go some way to identifying whether the supply of specialist teachers meets the anticipated demand.

That there is a limited supply of specialist subject teachers in some subject areas is not a new finding. Nor is the finding that more needs to be done to attract and retain them. The Council of Australian Governments (COAG) recognises the issue and commissioned the Productivity Commission to conduct research into the issue, the report of which was published in 2012.³⁹

It is clear that the department is well aware of the issue, and has a range of strategies that aim to address it.

The committee notes that the department is undertaking a broad range of reforms, including initiatives that focus on teacher quality and on teacher supply, all of which aim to maximise academic outcomes for students.^{40, 41} We also note the department's response to the Auditor-General's report, and support the strategies and action being taken to address the recommendations of the audit. Additional comment on departmental strategies is provided in section 2.2.

The department has indicated that it, in partnership with schools and the peak secondary school

³⁵ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p22

³⁶ Mr Jeff Hunt, *Hansard transcript*, 5 March 2012, p3; Productivity Commission, 2012, p92

³⁷ Eg Mr Clinton Jackson, cited in EIC Report no. 25, p137

³⁸ Government response to EIC Report no. 25, p13

³⁹ Productivity Commission Research Report, April 2012. *Schools Workforce*.

⁴⁰ For example, *Great Teachers = Great Results*

⁴¹ For example, *A Fresh Start*

principals association, is developing a strategy to reduce the imbalance in supply of specialist subject teachers, with a view to improving participation and achievement in STEM subjects by June 2014 (as per Auditor-General recommendation 3). The committee looks forward to the finalisation of this strategy.

2.1.1 Data shortcomings: forecasting future supply and demand

The department forecasts teacher supply and demand at the state level for primary, secondary and special schools. The forecasts:

... consider supply from Queensland universities and demand arising from student enrolment growth, historical teacher separation rates and teacher qualifications from a survey of teachers conducted most recently in 2010. The forecasts anticipate statewide demand for teachers in specialist subject areas where shortages have been reported by regional staffing officers and schools.⁴²

As identified in the previous section, the audit found that unreliable data impacts on the department's ability to accurately forecast specialist teacher supply and demand. Specifically, the Auditor-General observed that:

Without detailed and current forecasts of teacher demand by subject, the department is unable to develop integrated workforce plans at the state, regional and school levels. Strategies to attract the right teachers to the right schools at the right time could be designed better if forecasts included a greater level of detail. Scholarship programs for new teachers and retraining for teachers wanting to develop their expertise in new subject areas could be targeted better if reliable forecasts identified where they will be needed.⁴³

The department responded to this issue at the public briefing:

At the moment we have information in different systems. We have some information in our HR or payroll system. We have some information in our recruitment system. We have some information in our placement systems now. Because the people are dynamic and the workforce is dynamic, that system data is often dynamic as well. As you can imagine, each year a school publishes a new timetable based on student subject selection and that will change the workforce profile on an annual basis. What we are trying to pull up in that workforce planning through schools to the region to the centre is a better understanding and appreciation of how the demand side is being met by the supply side. In order to do that, in order to be able to go to universities and say, 'We think our forecast is for 200 more STEM [science, technology, engineering and mathematics] teachers over the next five-year period,' or whatever it might be, we need to be able to collect that information and share that with the supply side—collecting from the demand side, sharing with the supply side and working together over a longer term.⁴⁴

⁴² Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p5

⁴³ Ibid

⁴⁴ Hansard transcript, public briefing, Department of Education, Training and Employment, 5 March 2014, p11

Unreliable data also means that the department cannot “... accurately profile its secondary teaching workforce” or “... develop appropriate and proportionate strategies to ensure the future supply will be able to meet demand.”⁴⁵

Additionally, the audit identified there are no quotas or limits on the number of teaching places available or in what areas students specialise. Rather this is determined by universities and is based largely on student demand. As a result “there is an imbalance in the types of specialist teachers graduating from Queensland universities. DETE has identified shortages in teachers of mathematics, science and industrial design and technology.” Conversely, there is an oversupply of physical education, music/dance/drama and primary teachers.⁴⁶ At the briefing, the QAO told the committee that:

*In 2012 there were almost four times as many phys ed teachers who graduated from Queensland universities than maths teachers. Of the 1,200 who graduated with a primary qualification, there were only around 200 positions available for them within the Department of Education, Training and Employment.*⁴⁷

The QAO recommended that the department develops forecasts for supply and demand of specialist subject teachers that produce more accurate and comprehensive estimates of need at the state and regional levels and by subject, including junior secondary subjects by June 2014 (recommendation 4).

The department responded to this issue at the public briefing:

*The department works with universities “... to make sure that they understand from the employer’s perspective the range of demands that are on us and for us to understand the supply and demand from their side.”*⁴⁸

The department advised that university data indicates there has been an increase in the “... number of training teachers going into the shortage areas in secondary that were the subject of the report.”⁴⁹ This data was not provided to the committee.

The impact of market forces on forecasting teacher supply and demand was also identified by the department as noted on page 11 of this report. This includes, for example, economic conditions, career aspirations and family circumstances.⁵⁰

Committee comment

Reliable forecasting for the supply and demand of specialist subject teachers is critical.

We note the activity underway within the department to improve data quality, including the work in partnership with other bodies including universities.

The supply of university graduates in subject areas of need are somewhat outside the department’s control, however, the committee notes that the department works with universities to address this issue as far as practicable and may be seeing an improvement in the connection between graduate teacher supply and demand.

⁴⁵ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p3

⁴⁶ Ibid, p28

⁴⁷ *Hansard transcript, private hearing, Queensland Audit Office*, 20 November 2013, p3, published with permission

⁴⁸ *Hansard transcript, public briefing*, Department of Education, Training and Employment, 5 March 2014, p6

⁴⁹ Ibid, p6

⁵⁰ Ibid, p2

2.2 Placement of specialist subject teachers

A limited supply of teachers with specialist qualifications in some subjects, gives rise to the question of how to allocate what supply is available. One of the difficulties in placing specialist subject teachers in schools is the absence of specific qualification requirements.

As noted in the audit report, the Queensland College of Teachers (QCT) is responsible for setting the qualification requirements for teacher registration, however, does not “... set or recommend specific qualifications for specialist subject areas.”⁵¹

The audit identified that contributing to the challenge of placing specialist subject teachers is a lack of standards or guidance provided for principals to consistently assess whether “... teachers have the content knowledge, pedagogical skills and qualifications appropriate to the grade level or subject area they teach. This means that decisions about teacher capability or competence for specific subjects are inconsistent and not transparent.”⁵²

The department does not provide guidance or set standards for principals to assess whether teachers have the “... qualifications appropriate to the grade level or subject area they teach. This means that decisions about teacher capability or competence for specific subjects are inconsistent and not transparent.”⁵³

Teacher qualifications are instead documented in the department’s payroll system, in which “information about teacher competence and capability is not accurate.” For example, some data is incomplete, out of date or qualifications were not sighted. The audit concluded that that this affects the department’s ability to maximize student learning outcomes through the efficient placement of teachers in schools.⁵⁴

Other jurisdictions were examined during the audit with regard to specialist subject teacher qualification requirements. Victoria and New South Wales both provide guidelines about qualifications for specialist subject teachers.⁵⁵ The audit report advises that Queensland does not provide such guidelines.

The department identified some reasons why teachers may teach outside their area of specialty:

*... it is important to note that there can be a number of reasons why this may occur that are not related to just matters of supply. It is not unusual, for example, for an experienced teacher to seek opportunities to teach in a new field where they have developed a professional interest.*⁵⁶

Market forces are another factor that influence the placement of specialist subject teachers in secondary schools as highlighted by the department:

... just like any industry, in workforce supply and demand terms, there are market forces at play. While employers will actively manage and influence the market, there remains a broad range of factors at play—economic conditions, applicant preferences, attraction

⁵¹ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p44

⁵² Ibid, p23

⁵³ Ibid

⁵⁴ Ibid, p17

⁵⁵ See for example http://www.vit.vic.edu.au/SiteCollectionDocuments/PDF/Specialist_Area_Guidelines_2012.pdf

⁵⁶ Hansard transcript, public briefing, Department of Education, Training and Employment, 5 March 2014, p2

*and retention strategies, career aspirations, family circumstances and life decisions regarding leave, travel, marriage et cetera.*⁵⁷

Committee comment

The committee notes the challenges faced by the department in appropriately placing specialist subject teachers in schools. The importance of data availability and quality for addressing this issue, which is considered in more detail in the next section, is also acknowledged.

Queensland does not provide guidelines as to appropriate qualifications to teach each subject. However, despite the existence of guidelines in other jurisdictions, the committee understands that there is a similar lack of specialist teachers, and similar situations with regard to teachers teaching out of field.⁵⁸

While providing such guidelines might support the collection of better data on which to make allocation decisions, it is not clear that providing them would contribute in a cost-beneficial manner to addressing the issue of supply and allocation.

The range of reasons why teachers may teach outside their area of specialty, as identified by the department, are noted by the committee. The committee supports the strategies being implemented by the department to address these issues (see section 2.3), specifically those that relate to teacher attraction, teacher quality and data management.

2.2.1 Data issue: integrity and integration

The audit found that the department does not have current or reliable data on the number of teachers who teach subjects out of field; which subjects are most affected or which schools are most affected.⁵⁹ Data that is available was found to be incomplete and unreliable.⁶⁰ Contributing to this issue is that the department's "... human resource systems do not work together and integrate all the data that it has on teacher qualifications, experience or competencies."⁶¹

The QAO advised the committee that:

*... forecasting for future teacher demand is hindered by unreliable and out-of-date data on its current teachers' qualification and competencies. This means the department cannot accurately profile its workforce and it does not have a clear picture of how many maths, science, manual arts, home economics teachers it currently has, where those teachers are located, what subjects those teachers are teaching at the moment or when those teachers are going to retire.*⁶²

⁵⁷ Hansard transcript, public briefing, Department of Education, Training and Employment, 5 March 2014, p2

⁵⁸ Victorian Auditor-General's report, *Science and Mathematics Participation Rates and Initiatives*, 2012, accessed 29 April 2014, www.audit.vic.gov.au/publications/2011-12/20120606-Science-and-Maths/20120606-Science-and-Maths.pdf

⁵⁹ Hansard transcript, private briefing, Queensland Audit Office, 20 November 2013, p3, published with permission

⁶⁰ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p15

⁶¹ Hansard transcript, private briefing, Queensland Audit Office, 20 November 2013, p3, published with permission

⁶² Ibid, p3

The audit identified issues with the compatibility of the department's databases and the impact of this on the placement of specialist subject teachers:

*The Department of Education, Training and Employment (DETE) information on teacher competence and capability is fragmented into four different systems that do not integrate and are inconsistent. There is no single point of truth on secondary teacher capability and competency. This reduces the ability of principals and regional human resource consultants to ensure that teachers are placed in schools and subjects that best fit with their capabilities and competencies.*⁶³

The department collects data periodically through its teacher qualification survey:

*to identify core skills and knowledge, to develop strategies that improve the supply of qualified specialist subject teachers. The department does not have complete, accurate and reliable data on its workforce.*⁶⁴

Permanent teachers currently report their qualifications; whether they are undertaking further study; subject specific capabilities and experience and what subjects they are currently teaching. The audit report found that the "... data are self reported and not validated", and that the most recent survey was completed in 2010.⁶⁵ This impacts on the department's ability to identify shortages and allocate teachers to areas of need.⁶⁶

QAO auditors visited seven state schools during the audit.⁶⁷ The qualifications of teachers were assessed and teachers were spoken to individually. The audit found that:

*Information about teacher competence and capability is not accurate. At the schools we visited, the data on teacher qualifications in TSS [the department's payroll system] were, on average, incomplete for five per cent of teachers and out of date for 23 per cent of teachers. Of all the qualifications in TSS for secondary teachers, seven per cent were not sighted.*⁶⁸

An outcome of unreliable data is that it "... reduces the department's ability to maximise student learning outcomes through an efficient placement of qualified and capable teachers."⁶⁹

The audit recommended that the department improves the quality of the information on teacher subject capability and competence available to staffing officers and principals to improve the placement of teachers at schools and on school timetables by December 2014 (recommendation 1).

In the department's response to the Auditor-General report, it acknowledged that "several key constraints have impacted on DETE's ability to fully address the issues that have been mutually identified to this point in time."⁷⁰ This includes data limitations and the limited influence the department has on supply chain and funding.⁷¹

⁶³ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p17

⁶⁴ Ibid, p27

⁶⁵ Ibid

⁶⁶ Ibid

⁶⁷ Ibid, p8

⁶⁸ Ibid, p17

⁶⁹ Ibid

⁷⁰ Ibid, p38

⁷¹ Ibid

At the public briefing the department advised the committee that it is “... *cleansing systems data to ensure that schools and HR practitioners across the state have access to better information.*”⁷²

In addition:

*We are drafting change requests to IT systems that will be subject to funding approval but will enhance the processes internally in managing the range of data associated with managing teacher supply and demand. We are working closely with universities to map data and professional learning materials for out-of-field teachers to support that part of the recommendations in the report.*⁷³

The department also considers that data gaps will be “... *strengthened by the 2014 snapshot that we are undertaking.*”⁷⁴

Committee comment

The lack of reliable data on teachers that teach out of field, and which subjects and schools are most affected, is of concern to the committee. Without reliable processes to collect, store and report data on specialist subject teachers it is not possible to place teachers where they are needed.

If the important data collected through the department’s teacher qualification survey is to be depended upon, it should be validated and collected more frequently. If it is decided that alternative methods are more appropriate to collect this information, then these methods should be fast-tracked to ensure quality data is being used in planning the placement of specialist subject teachers.

Action being taken by the department to improve the quality of data available is noted by the committee. The committee looks forward to learning of additional progress made by the department towards achieving Auditor-General’s recommendation 1.

2.3 Strategies to address the issues

The department identified a number of broader strategies that should assist in addressing the issues identified by the audit, while acknowledging the constraints that affect its ability to fully address the issues raised (for example, limited influence over university business, and available funding).⁷⁵ Actions to address the data limitations have been discussed above.

These are broad strategies and not implemented as a specific response to the Auditor-General’s recommendations, reflecting the department’s long-term acknowledgment of, and actions to address, the issues around supply and placement. They relate to workforce planning, teaching standards, school autonomy, teacher training and recruitment and are outlined below.

Great teachers = Great results

The Great teachers = Great results (GTGR) action plan intends to “... *improve the status of teachers, reward our high-performing teachers through accelerated career pathways, and enable struggling*

⁷² Hansard transcript, public briefing, Department of Education, Training and Employment, 5 March 2014, p4

⁷³ Ibid, p5

⁷⁴ Ibid

⁷⁵ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, pp38-39

schools access to the highest performing teachers.”⁷⁶ At the public briefing, the department advised the committee that the main focus of GTGR is teacher quality, and that teacher professionalism would be incentivised and encouraged under the plan in order to lift student outcomes.⁷⁷

Strategies that will be introduced by GTGR include, for example, the introduction of an accredited mentoring program for new teachers; new rewards for high performing teachers and principals and the expansion of independent public schools.⁷⁸ In addition, the department advised that:

We are offering up to 300 master scholarships so that teachers who have not engaged in postgraduate qualifications will be more encouraged to do so. Then it is also a part of the practical application of those higher qualified teachers into schools that need them the most. We would be targeting the placement of those master teachers into more needy schools. It is part of our broader strategy.⁷⁹

A Fresh Start

The government response to the 2012 Teacher Education Implementation Taskforce is provided in A Fresh Start, which includes initiatives focused on attracting teachers to the profession; teacher skills, knowledge and experience and transition from pre-service to commencing teaching.⁸⁰ A Fresh Start strategy:

... includes a suite of interconnected strategic initiatives focused around issues of attracting the highest quality applicants into the teaching profession, ensuring that they have the essential skills, knowledge and experience required for the diverse real world of contemporary Queensland schooling and supporting their transition from pre-service to beginning teaching.⁸¹

The strategy:

encourages higher education institutions to work more closely with schools and teachers ... [to, amongst other things] ... ensure the mix of graduates meets the needs of the three Queensland schooling sectors.⁸²

It also addresses expectations of teacher education programs at universities:

As universities are funded by the Australian government, teacher employers and, for that matter, state governments commonly have little leverage to influence university practices. Teaching graduates are, however, required to undertake set periods of professional experience in schools during their studies so as to qualify for teacher registration. So under A Fresh Start Queensland universities will be required to enter into professional experience partnership agreements with the department that will make explicit the range of expectations, including processes, that enable a mix of teaching graduates that better aligns with school and workforce needs and agreement with

⁷⁶ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p39

⁷⁷ *Hansard transcript, public briefing*, Department of Education, Training and Employment, 5 March 2014, p7

⁷⁸ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p40

⁷⁹ *Hansard transcript, public briefing*, Department of Education, Training and Employment, 5 March 2014, p7

⁸⁰ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p40

⁸¹ *Hansard transcript, public briefing*, Department of Education, Training and Employment, 5 March 2014, p4

⁸² Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p40

*regard to the sharing of data to inform forward planning for both universities and school systems.*⁸³

Renewal strategy

Another strategy the department drew the committee's attention to is the departmental renewal strategy which was launched in 2013 and recently finalised. The strategy introduces a new operating model for service delivery which:

*... establishes clearer roles and responsibilities across schools, regions and central office and will ensure our organisational structure is even more focused on improving outcomes for students and that we have the structure, accountabilities and resources in place to support our key priorities.*⁸⁴

Make a difference. Teach

The department's 'Make a difference. Teach' recruitment campaign intends to "... provide clear information to teaching aspirants about the teaching areas and locations where employment prospects are high."⁸⁵ In addition, the remote area incentive scheme provides:

*... financial and other incentives for teachers to work in non-preferred locations. That is an important attraction and retention strategy for teachers in hard to fill geographic locations.*⁸⁶

The Minister launched the department's Teach Rural campaign in April 2014, which aims to "... attract teachers to high priority teaching areas and locations outside Queensland's south-east corner." Up to 1,300 extra junior secondary teachers are needed to support the move of Year 7 to secondary school in 2015.⁸⁷

Scholarship program

Another incentive for teachers to work in areas of need is the department's scholarship and grant programs, which "... attract aspirants with high-demand skills or to areas of teaching shortage."⁸⁸ At the public briefing, the department advised the committee that:

*... we have also seen a significant increase in the number of applicants for the scholarship programs that we are offering which is targeted at the shortage areas and the geographic locations that are harder to staff. That indication is suggesting that our strategies around attraction are also taking bite ... What we are seeing for the first time in a little while at least is the increase in the intake of the universities into those areas which is good for us when those students start to flow through into the workforce.*⁸⁹

⁸³ Hansard transcript, public briefing, Department of Education, Training and Employment, 5 March 2014, p4

⁸⁴ Ibid, p3

⁸⁵ Ibid, p4

⁸⁶ Ibid

⁸⁷ Minister for Education, Training and Employment, media release, *Broaden your horizons and Teach Rural*, 25 April 2014, p1

⁸⁸ Hansard transcript, public briefing, Department of Education, Training and Employment, 5 March 2014, p4

⁸⁹ Ibid, p6

The department also advised the committee that it is:

*... working with schooling sectors and universities closely to better target strategies with demand around the STEM subjects. We are implementing scholarship programs and targeting these areas specifically, developing specific workforce plans for shortage areas in secondary as part of the department's broader workforce development and planning and implementing the 2014 supply and demand mapping process ...*⁹⁰

However, the audit found that the long term impacts of these programs are not evaluated, which:

*... means DETE has missed opportunities to adjust the focus of the initiatives to reflect necessary changes identified in the monitoring and evaluation process. It does not know whether its workforce initiatives have achieved the desired outcomes, nor whether it has succeeded in addressing identified workforce gaps.*⁹¹

The committee sought to establish whether the strategies described by the department were developed in response to the Auditor-General's report, or whether they were already in existence. The department advised that generally the strategies were in place before the audit was completed, in response to the Curriculum into the Classroom (C2C) project.⁹² This project assists Queensland schools in the roll out of the Prep - Year 10 Australian curriculum:

*... the department is doing a whole range of activities to make sure that resources online are available to those teachers that do teach out of field ... we have the Curriculum into the Classroom materials, which is a comprehensive suite of planning materials for teachers, resources for teachers, right down to individual lesson plans with assessment and with individual resources tied to those lesson plans ... We also provide models on how to teach, monitor and assess science and mathematics, provide resources to enhance teacher capability to deliver science and mathematics, and provide quality assured resources ... We are also, in partnership with the Queensland College of Teachers, developing some online modules because it is not always easy for teachers to access face-to-face professional development in rural and remote areas. These modules are designed to strengthen teacher capability in the key areas of mathematics and science.*⁹³

In the department's response to the Auditor-General report, it noted that it:

*... looks forward to providing the Queensland Parliament with reports as required on progress against these [five Auditor-General recommendations] so that both Parliament and the people of Queensland retain confidence that our schools have access to the workforce they need to deliver a an [sic] education system the equal of those in the highest-performing systems in the world.*⁹⁴

⁹⁰ Hansard transcript, public briefing, Department of Education, Training and Employment, 5 March 2014, p5

⁹¹ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p32

⁹² Hansard transcript, public briefing, Department of Education, Training and Employment, 5 March 2014, p8

⁹³ Ibid, pp7-8

⁹⁴ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p42

2.4 Audit recommendations

The audit report recommended that the Department of Education, Training and Employment:

1. Improves the quality of the information on teacher subject capability and competence available to staffing officers and principals to improve the placement of teachers at schools and on school timetables by **December 2014**.
2. Provides teachers who are teaching subjects out of their field of expertise with the support and professional development needed to develop the content knowledge and pedagogical skills relevant to the subject being taught by **June 2014**.
3. Develops and implements a strategy to reduce the imbalance in the supply of specialist subject teachers with a view to improving participation and achievement in Science, Technology, Engineering and Mathematics (STEM) subjects by **June 2014**
4. Develops forecasts for supply and demand of specialist subject teachers that produce more accurate and comprehensive estimates of need at the state and regional levels and by subject, including junior secondary subjects by **June 2014**
5. Integrates and coordinates its approach to workforce plans and initiatives at central, regional and school levels by **December 2014**.

Committee comment

The committee has noted the department's advice as attached to the audit report, along with the briefing provided by the department on 5 March 2014, with respect to progress towards implementing the five recommendations made by the Auditor-General. The committee is also aware of initiatives being delivered by the Queensland Studies Authority as part of the government's response to its inquiry into the assessment of senior mathematics, chemistry and physics in Queensland schools (particularly in respect of recommendation 2).

Given the scope of the audit, and the challenge of isolating the effectiveness and efficiency with which the department is addressing the supply and placement of specialist subject teachers as a contributor to academic outcomes, the department provided advice on strategies that are broader than the recommendations outlined above. Clearly the department has been working to address the issue of supply for some time, and so in many cases the recommendations made as part of the performance audit are being implemented as components of broader strategies that address more than the efficiency and effectiveness focus of the performance audit.

The committee notes the range of strategies being implemented by the department that may assist in addressing the issues identified by the Auditor-General. The department's strategies to support workforce planning, including teacher quality, are relevant to the recommendations of the audit report.

Recommendations 1, 4 and 5 relate to improving data quality, so that decisions about placement (recommendations 1 and 5) and strategies to maximise supply (recommendation 4) can be more effective, have been explicitly addressed by the department, and discussed in the body of this report.

The department is cleansing data systems, progressing improvements to its information technology systems and working directly with universities, which the committee considers are targeted actions that will assist in addressing the issues identified in respect of data shortcomings

The committee notes the department's advice that it is working with its partners to develop a strategy to reduce the imbalance in the supply of specialist subject teachers with a view to improving participation and achievement in Science, Technology, Engineering and Mathematics (STEM) subjects by June 2014; and that the Fresh Start strategy aims to improve the supply and mix of graduates from Queensland higher education institutions (recommendation 3).⁹⁵

The absence of evaluation of the department's scholarship and grants programs is of concern to the committee as it remains unknown whether the initiatives have achieved their intended goals.

The department's response to the Auditor-General report is noted by the committee, in which it advised that it is happy to provide reports to the Parliament on progress towards meeting the Auditor-General's recommendations. This commitment is welcomed by the committee.

Recommendation 2

The committee recommends that the Minister for Education, Training and Employment tables a report in the Parliament on the department's progress towards meeting the Auditor-General's five recommendations contained in his Report to Parliament 2 for 2013-14, *Supply of specialist subject teachers in secondary schools*, by March 2015.

⁹⁵ Auditor-General Report to Parliament 2: 2013-14, *Supply of specialist subject teachers in secondary schools*, p43