

**Evaluation of the Years 1 to 10  
Mathematics Key Learning Area  
Curriculum Development Project**

**Report 2**

*An Evaluation and Review Report prepared  
for the Queensland School Curriculum Council by*



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**QUEENSLAND  
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## Executive Summary

### The Project

The purpose of the Years 1 to 10 Mathematics Curriculum Development Project is to design, develop and disseminate a Years 1 to 10 syllabus, sourcebooks and initial in-service materials in Mathematics for use in Queensland schools. The Project commenced in January 1999 with the formation of a project team. A trial phase occurred during 2000, and in 2001, the project team extensively revised the draft syllabus-in-development in a 'trial and development' phase. This phase included wide consultation with interested people and groups and a formal process in which sixteen schools worked with the team providing critical comment and suggestions on draft materials.

The main activities for the trial and development teachers were to:

- Provide structured reaction, at school level, to drafts of the outcomes and elaborations in each of the syllabus strands
- Discuss and critique, at cluster level, the completed draft syllabus.

### The Evaluation

During 2001, external evaluation of the project focused on the trial and development phase, and had three main components:

- Visits to the trial and development schools to interview participating teachers
- A survey of all teachers participating in the trial and development phase
- A structured external review of the syllabus-in-development, intended to characterise the draft curriculum and obtain structured response from the major stakeholders in the project, namely Education Queensland, Queensland Catholic Education Commission and Association of Independent Schools of Queensland Inc.

### Conclusions

The evaluation was structured around a set of nine focus questions. A separate conclusion is provided for each focus question.

Focus question 1: How well is the trial and development process progressing?

By the beginning of Semester Two 2001, the project was progressing well. Teachers generally appreciated the efforts of the project team and the account taken of teacher comments and suggestions. Response to the staged implementation of the materials was positive. Overall, the teachers indicated a feeling of control over the development of materials, appreciating the acknowledgment and inclusion of much of their feedback to the team. There was also evidence of frustration among some of the teachers with the pressure of deadlines for responses to drafts and the time needed outside of classroom hours for communication with the project team.

Focus question 2: To what extent do the draft curriculum materials reflect current and emerging views of education and of educators in mathematics?

Taken together, the results can be interpreted as broad recognition that the draft curriculum is generally in line with current thinking about mathematics and mathematics education. Most of the teachers saw the current topics as appropriate and believed that the developing curriculum would be an improvement over current programs. For the most part, the

three school authorities appear to accept most of the responses of the draft curriculum to the range of issues identified in the external review, but some reservations and concerns remained. Education Queensland expressed concerns that mental calculations were not specifically emphasised in the early years, that the syllabus introduction did not refer to the needs of learners at stages of development, and that elaborations might not necessarily be interpreted as guides to the sequence of development of mathematics concepts. Education Queensland expressed reservations that assessment and reporting issues were not yet resolved and that more could be done to provide guidance for teaching for diversity. AISQ expressed reservations that teachers could teach the outcomes and elaborations in isolation from the broader purposes of mathematics teaching and important pedagogical considerations, and that the Year 7–8 interface may present problems where the present 1 to 10 syllabus had not been adopted in secondary levels. We believe, however, that consultation between the project team and the three school authorities should be able to resolve these reservations and concerns.

Focus question 3: To what extent do the draft curriculum materials satisfy the identified needs of all students, teachers and school administrators?

The draft materials were clearly effective in meeting the needs of teachers and had good potential to meet the needs of the students in the range of schools participating in the trial and development phase.

Focus question 4: In the light of answers to the above, what changes, if any, might be made to the intent and content of the draft curriculum materials?

Further development of the draft materials should focus on:

- Modifying the elaborations to bring out Working Mathematically more clearly
- Re-examining the level placement of content
- Addressing the various reservations of the major stakeholders about the response of the draft materials to issues identified in the external review.

Focus question 5: How effectively will the draft curriculum materials be applied in planning, teaching and learning contexts?

In their current form, the draft curriculum materials provide a sound, workable basis for planning, teaching and learning contexts. At this stage, the elaborations are providing a vehicle for understanding the learning outcomes in the new syllabus. We propose that further development of the draft materials should focus on modifying the elaborations, re-examining the level placement of content, and addressing the various specific reservations of the representatives of school authorities about the response of the draft materials to issues identified in the external review.

Focus question 6: How well have the trial and development schools been able to assess the performance and progress of all students using the draft curriculum materials?

It was too early in the project to examine in any depth the ability of schools to apply the draft materials to assessment and reporting. Nevertheless, assessment was an area of concern for some of the trial and development teachers. Some of the concerns indicated misunderstandings about the place of outcomes and elaborations in assessment and reporting. The nature and purpose of core learning outcomes and elaborations need to be addressed in association with the extended trial phase of the project and in the initial in-service materials.

Focus question 7: In light of the above, what improvements may be made to the draft curriculum materials?

The trial and development process has been successful in providing teachers with avenues for meaningful participation in the continuous improvement of the draft curriculum materials and no specific suggestions for further improvement emerged from the evaluation.

Focus question 8: To what extent has the emphasis on the electronic provision of materials made the job of planning and implementation easier or harder for teachers?

Provided the CD can be made easier for teachers to use, it has high potential for making the curriculum accessible and providing assistance with planning processes. Its value, however, is contingent upon the ability of teachers to use software of this kind, their access to suitable computers and their readiness to apply computer-based processes to school and classroom planning.

Focus question 9: What changes could be made to the materials to make them easier to work with?

The provision of materials in electronic format promises significant advantages in making the curriculum materials easier to work with, but cannot substitute totally for person-to-person interaction involving colleagues or support personnel. School authorities may need to consider ways to provide direct support to teachers from this point on.

## **Discussion**

The trial and development process has been successful in providing a sound basis for the expected extended trial phase of the Years 1 to 10 Mathematics curriculum development project. Through a cyclic process of draft–structured feedback–redraft, a well-accepted syllabus has been developed.

The provision of syllabus and associated materials in electronic format promises significant benefits over print format, and this is recognised by many of the trial and development teachers, but not all teachers were able to take full advantage of electronic technology. Even some of those who had no difficulty accessing the CD-ROM appeared to be more appreciative of the interaction provided by school visits from the project team and by cluster conferences involving other teachers.

Taking the evaluation results as a whole, and considering the purposes of the trial and development phase, we consider that the project will be in a sound position to proceed to the extended trial phase in 2002.

## **1. Introduction**

### **1.1 Purposes of the Evaluation**

The purpose of the external evaluation is to provide advice on:

- The appropriateness of the Years 1 to 10 Mathematics Syllabus (in development) and sample school programs, sourcebook guidelines and sample sourcebook modules, in meeting the needs of students, teachers, and school administrators
- The effectiveness of the Years 1 to 10 Mathematics Syllabus, sourcebook guidelines, sample modules and sample school programs in schools as resources for planning and implementing appropriate school and classroom mathematics programs
- The efficiency of use of the Years 1 to 10 Mathematics Syllabus and sample school programs, sourcebook guidelines and sample sourcebook modules.

The first evaluation report, focusing on the initial trial phase, was presented in December 2000. This second report focuses on the trial and development phase of the project during school year 2001.

### **1.2 The Years 1 to 10 Mathematics Curriculum Development Project**

The purpose of the Years 1 to 10 Mathematics Curriculum Development Project is to design, develop and disseminate a Years 1 to 10 syllabus, sourcebooks and initial in-service materials in Mathematics for use in Queensland schools.

The Project commenced in January 1999 with the formation of a project team. A trial phase occurred during 2000 involving a group of 15 schools nominated by Education Queensland, the Queensland Catholic Education Commission (QCEC) and the Association of Independent Schools of Queensland Inc. (AISQ).

The project was originally planned to enter an extended trial phase in 2001 with project completion by December 2002. Towards the end of 2000, however, the timeline for the project was extended with completion now expected in 2003. During 2001, responding to conclusions and comments from Evaluation Report 1, the project team extensively revised the draft syllabus-in-development in a 'trial and development' phase.

During the trial and development phase, 16 schools worked with the project team providing critical comment and suggestions on draft materials. The 16 schools included 14 of the original trial schools (one withdrew due to staff changes) and two other schools. One of the additional schools was selected on the basis of its similar characteristics to the school that withdrew, and the other was invited to participate to obtain input from the perspective of an Aboriginal community school. The trial and development schools are listed in Appendix 6.

An important component of the project was the extensive consultation with a wide range of interested groups and individuals, including academics, teacher unions, professional associations, parent groups and schools not participating in the trial processes.

During 2001, the evaluation focused on the trial and development phase of the curriculum development process. The main activities for the trial and development teachers were to:



- Provide structured reaction, at school level, to drafts of the outcomes and elaborations in each of the syllabus strands
- Discuss and critique, at cluster level, the completed draft syllabus.

The nature of the trial and development process provided limited opportunity for most of the schools to carry out classroom activities based on the draft syllabus to any great extent by the time external evaluation data were collected. Section 2.1.3 gives an indication of what the schools had done with the draft materials by the first few weeks in Semester Two, 2001.

### **1.3 Evaluation Focus**

In fulfilling the purposes of the evaluation, the following focus questions were addressed:

1. How well is the trial and development process progressing?
2. To what extent do the draft curriculum materials reflect current and emerging views of education and of educators in mathematics?
3. To what extent do the draft curriculum materials satisfy the identified needs of all students, teachers and school administrators?
4. In the light of answers to the above, what changes, if any, might be made to the intent and content of the draft curriculum materials?
5. How effectively will the draft curriculum materials be applied in planning, teaching and learning contexts?
6. How well have the syllabus-in-development schools been able to assess the performance and progress of all students using the draft curriculum materials?
7. In light of the above, what improvements may be made to the draft curriculum materials?
8. To what extent has the emphasis on the electronic provision of materials made the job of planning and implementation easier or harder for teachers?
9. What changes could be made to the materials to make them easier to work with?

### **1.4 Evaluation Approach**

The evaluation approach had three main components:

- A set of visits to the trial and development schools to interview participating teachers
- A survey of all teachers participating in the trial and development phase
- A structured external review of the syllabus-in-development.

The survey and interviews of trial and development teachers occurred during July and August 2001. By the commencement of interviews, all trial and development schools had been provided with copies of the re-drafted materials. The external review process took place from May to August 2001.

#### **1.4.1 The Interviews**

Interviews were held with teachers from 14 of the 16 trial and development schools. Two schools had only recently joined the project and interviews there would have been premature.

The interview questions, developed from the Evaluation Focus Questions, were sent to the trial and development schools early in July, and each school was requested to provide time for an interview with at least one trial and development teacher. In some cases, two or more teachers were interviewed and in a few cases, interviews were held with the school principal. In most cases, the interviews were held in the schools, but the interviews for Tieri State School and Our Lady of the Sacred Heart School at

Springsure were conducted in Emerald in conjunction with the cluster conference there on 31 July.

Interviews followed a set format, beginning with general questions and proceeding to more specific issues. Most questions dealt with the teachers' opinions of the draft materials in the context of their particular schools and classes. The interview questions are shown in Appendix 1.

### **1.4.2 The Survey**

Every trial and development teacher in the 14 schools where interviews were held was invited to take part in a mail survey. Questionnaires were mailed to the principal of each school with a request to distribute the surveys to the participating teachers and return the completed forms.

The survey questionnaire is reproduced in Appendix 2. The survey focused mainly on the workability and appropriateness of the draft materials. Most items required ratings on a five-point scale (Very Low, Low, Moderate, High, Very High). For example:

*How do you rate the potential of the present syllabus-in-development materials for meeting the needs of the students that you teach?*

Background items included Year levels taught, whether a trial teacher in 2000, school sector, training in mathematics, teaching experience and familiarity with the draft materials.

The results of the survey as a whole are presented in Appendix 5.

### **1.4.3 The External Review**

The external review was planned to characterise the draft curriculum and obtain structured response from the major stakeholders in the project, namely Education Queensland, Queensland Catholic Education Commission and Association of Independent Schools of Queensland Inc. The review consisted of three stages:

In Stage 1, members of the evaluation team generated a set of issues that were considered to be of current importance in the framing of a school mathematics curriculum. This list was then refined in consultation with the Years 1 to 10 Mathematics project team. The issues are shown in Display 1. An example of an issue is 'The relative emphasis between mental computation and standard written forms'.

In Stage 2, the Years 1 to 10 Mathematics project team met with the leader of the evaluation team to prepare a description of how the draft-in-development Years 1 to 10 Mathematics curriculum responds to each of the issues identified in Stage 1. This exercise provided a characterisation of the draft materials in terms of the issues. The characterisation of the draft curriculum is shown in Table 1. For example, the response of the draft curriculum to the mental computation issue was:

*There is emphasis in the earlier levels on the growth of mental computations in preference to written computations. Specific mention of mental computation is made in the core learning outcomes at level 2. It is left open elsewhere for the selection of preferred working options.*

In Stage 3, the results of Stages 1 and 2 were sent to the Council representatives for the three major stakeholders (Education Queensland, Association of Independent Schools of Queensland Inc., Queensland Catholic Education Commission) with a request for an assessment of their appropriateness for the respective organisations. In addition, extended comment was invited on each issue. For each issue and response, the question was:

*Is this response appropriate for your organisation?*

- Yes
- Yes with reservations
- No

For Stage 3, the response sheets were bound into a booklet, which was mailed to each of the three representatives with a request for an interview to record and discuss the comments. The booklet contents are illustrated in Appendix 3.

Completed booklets were returned from all three organisations. The results of the external review are shown in full in Appendix 4.

We note here that the Council representatives for Queensland Teachers' Union and Queensland Independent Education Union were invited to take part, but responses had not been received by the end of August.

### **Display 1: Characterisation of Draft Curriculum**

<b>Issue</b>	<b>How the draft curriculum responds to the issue</b>
The forms and roles of assessment and reporting	The draft syllabus section on assessment and reporting contains advice well beyond earlier syllabuses. There is a link between that and the Council's Assessment and Reporting Draft Policy And Guidelines.
Catering for diversity in the teaching of mathematics	The draft syllabus makes specific comment on this issue. The way the core learning outcomes are written allows for a wide range of teaching-learning processes to cater for the needs of different students or different groups. The outcomes approach is a socially just approach.
The relative emphasis between mental computation and standard written forms.	There is emphasis in the earlier levels on the growth of mental computations in preference to written computations. Specific mention of mental computation is made in the core learning outcomes at levels 2 and 3. It is not specifically excluded elsewhere.
The role of language in mathematics	The role of language in mathematics is seen as absolutely critical. The words 'everyday language' appear often in outcomes at early levels, and the use of everyday language is encouraged. The support materials encourage teachers to let children work together, which should support development of better understanding. Attempts are made throughout the syllabus and materials to be consistent in the use of terminology.  In outcomes, frequent use is made of words such as explain, describe and identify. Even though the use of language is consistent within the syllabus, the ways the core learning outcomes are worded can allow teachers to explain using students' language and accept students' own language use. There is flexibility in what teachers can accept from students. On the other hand, as progress is made to the higher levels, then the language of mathematics becomes more conventional and formalised.
Mathematics curriculum for the middle years of schooling	The syllabus is very developmentally set out. This will give teachers an understanding of how mathematics education is developed. It will, like the Year Two Diagnostic Net, help teachers to understand how mathematics concepts develop and

Issue	How the draft curriculum responds to the issue
	how children learn. The core learning outcomes clearly show the developmental nature of mathematics. This applies to all strands and across all levels.
Teachers' understanding of mathematics education	The detail provided via the core learning outcomes and elaborations will equip non-mathematics trained teachers to plan and teach effectively, help to monitor learning and assist in the identification of common difficulties that students are having.
The nature of numeracy and its place in the mathematics key learning area	Numeracy is seen as one of four cross-curricular priorities. The rationale has a brief statement on numeracy (page 6). This statement is in line with the Queensland School Curriculum Council position paper on numeracy. The position taken is that mathematics provides the tools for numeracy. Numeracy demands that students can apply the tools in a range of contexts.
The place of realistic mathematics	The syllabus rationale deals with this issue in some respects. The core learning outcomes and elaborations talk about using the mathematics in realistic situations. This will be further emphasised in the support materials. The draft syllabus gives enough scope for teachers to use methods based on realistic problems and situations.
The role of learning technologies	The draft syllabus is explicit about encouraging the use of computers and calculators etc. in relevant places. Equity and access considerations have prevented specific mention in core learning outcomes of the use of learning technology and other technologies, especially electronics-based technologies. By design, teaching learning processes have been left to the school and teacher. There will, however, be suggestions and sample modules in the support materials related to the effective use of technology, especially electronics-based technologies.
Practicality for teachers: the ease with which teachers can understand and learn to use the new curriculum	It is a mental leap for teachers to plan on the basis of what students learn rather than on what is to be taught. Elaborations are provided to assist teachers to unpack the outcomes. Support materials will provide sample teaching–learning activities, planning proformas and assessment advice.
Continuity with current programs (1–10, 11–12)	It is possible for schools and teachers to use the 1 to 10 syllabus in planning for outcomes at school or classroom level. Outcomes should be compatible with processes (inputs) and content in the old 1–10 syllabus. The new syllabus puts focus more on what students will learn and have learned.

## 2. Progress of the Trial and Development Phase

### Focus Question 1

How well is the trial and development process progressing?

### 2.1 Interviews with trial and development teachers

The progress of the trial and development phase was addressed in the interviews with four questions. The responses to each question are presented below.

#### 2.1.1 Question 1: What messages do you have for the Project Team, the Evaluator or the Queensland School Curriculum Council?

The responses to this question indicated strong support for the work of the project team but some concerns over the time pressure involved with providing feedback on successive drafts. Some welcomed the extension of the project timeline.

Many of the messages made reference to the progress of the trial. Some appreciated the work done by the project team (five comments):

- *Overall they are doing a very good job.*
- *I think they are doing a mighty job under fairly trying circumstances. The way they have tried to include everybody has been highly commendable.*
- *For the project team—basically I think they are doing a great job.*
- *It is going OK.*

Some registered misgivings about the pressure associated with timelines for reaction to drafts (five comments):

- *When they send out their materials to evaluate they give us two weeks to respond and this is not enough. There is not enough time to do it on a whole school basis.*
- *We know there is a lot of paper work and it is very time consuming to read it all and try to figure out what it all means. I know it is the job of the trial but is there another way without the reams of paper?*
- *We get a whole strand at a time with the questions. I feel they must know what they are doing and perhaps they could pick out some particular parts and ask for comments on that. We sometimes feel a bit inadequate commenting on the whole thing.*

Some appreciated the fact that the timeline for the development had been extended. For example (four comments):

- *We're glad it's slowed down. We're coming to terms with planning for outcomes.*
- *A blessing that things have slowed down. So much to do, so little time with other KLAs as well.*

#### 2.1.2 Interview question 4: How well is the project progressing overall?

Most of the teachers had praise for the efforts of the progress team. Some concerns were expressed about the assessment and reporting and a few of the teachers referred to uneven progress through the year.

Three of the teachers (two primary, one secondary) expressed concerns about assessment issues:

- *I think they are doing well but I have a small concern over how the reporting and assessment side is going. [primary]*
- *The project is going well but we need to be sure that we can get definite guidance on assessment and reporting. We think that as much time should be spent on assessment and reporting as on the elaborations. [primary]*
- *People are still not happy with the assessment and reporting sections. The project team has told us to stay away from assessment and reporting but now they are trying to tackle that. [secondary]*

A few (three comments) seemed to be a little disturbed with the uneven rate of progress through the year, with apparent slow progress alternating with major change:

- *It is a little bit stop and start. I think the recent major rewrite indicates a little bit of uncertainty about how to progress. There is a definite feeling the syllabus is in flux at the moment. But I would like to comment that they are responding and reacting to change well.*
- *It is definitely going forward, but the direction seems to change and it is sometimes hard to keep up with it. Every time we see it, it is changed considerably.*
- *Probably going slower than originally planned. Drastic changes have been made recently so they seem to be back where they started at the start of the year. It is hard to see how they can do a pilot next year.*

The majority of responses (seven comments) praised the efforts of the project team:

- *I think it is progressing very well. They seem to be able to make continual progress at almost an amazing speed. I actually expected the whole thing to grind to a slow walk due to bureaucracy but it is going very well.*
- *To me it seems to be going positively.*
- *The actual process of syllabus development is quite good at the moment. We have had a number of revisions, including some dramatic changes to the betterment of the syllabus. They are listening to us and making changes.*
- *Overall I think they have made some great headway with the new syllabus and I feel very positive about where the syllabus is heading.*

As in the messages in 2.1.1, some (four comments) were glad that the timeline had been extended:

- *It seems to be fine. I understand why things have slowed down. They are trying to do an exceptionally thorough job and that has a cost in terms of time.*
- *We were pleased that they chose to slow it down. It would have been a bit overwhelming for us to do it this year otherwise.*

### **2.1.3 Interview question 7: What have you done so far in regard to the draft materials?**

The project team had not requested the trial and development schools to undertake any systematic implementation of the draft materials, but six of the 14 schools had chosen to put the draft curriculum into practice.

Six of the 14 schools had implemented the draft curriculum in at least one Year level:

- *I have been using them as the class program all year.*
- *Implemented across Year 8.*
- *We are using the materials as our basic program in maths. As a whole school we are planning a complete unit at junior and senior school based totally on the curriculum.*
- *We have actually used it as the basis for the school program this year from 1–10. We have conducted staff seminars within the school, especially about the new strands and how to go about that.*

Another six schools had provided comment to the project team but not attempted to apply the materials to planning or teaching:

- *Not much. We have worked through them and provided feedback to the team.*
- *We have been holding back because of the frequent changes. This makes it very difficult to plan. We have been responding to the drafts coming through. When the pilot comes online we will be more than ready to do it. I am getting impatient to trial the thing.*

Two schools had commenced planning activities but had not begun to apply the materials in the classroom:

- *Planned with outcomes. Critically evaluated the materials.*
- *We are doing some planning using the draft materials and some familiarisation with other staff members.*

#### **2.1.4 Interview question 3: The project team has set up various communication channels with the trial and development schools. How readily are you able to communicate your views to the project team?**

This item was included because two-way information flow between the project team and the schools is crucial to the success of the trial and development process. Responses showed that communication by email was convenient for some but by no means all teachers. Many preferred telephone contact. Finding time for contacting the project team was a common problem.

Some found that the team was easy to contact by email (four comments). For example:

- *Fairly readily — email is great.*
- *Easy enough. They ring or email and we respond via the principal usually by mail. We have no problem with email.*
- *With email it is really easy, and in my classroom I have access to the Internet. It is harder for other teachers who don't have that but it is not difficult.*

Some teachers had problems with communicating by email because of access (three comments):

- *One of us has limited access to email and the other has no access to email. It would be easier if we had good direct contact by email.*
- *My email wasn't working; there was some technological glitch. This caused me some problems. I did stuff in hard copy and mailed it. I'd really rather work online.*
- *We have only one Internet line so a lot of the communication has to be done after hours or from home. We do it from home often because this is the easier way. If we didn't do it from home it would be virtually impossible. We wouldn't have time to do it at school anyway.*

Some commented that the project team was easy to contact by telephone (four comments):

- *Excellent. I ring when I have a question and they give an instant response. They are just fabulous. They use email often.*
- *The team is very approachable and open to suggestion. I usually communicate by phone with no problem. Sometimes I use fax but not email.*
- *I find them very receptive. You can talk to them on the phone. There are plenty of coordinating meetings. They are very approachable and proactive. I don't use email but I have no problems communicating by phone or fax.*
- *Our school has an email problem but I find it very easy to get on the phone and talk to them.*

Time for communicating was a problem for some teachers – a factor the project team needs to be aware of (three comments):

- *Sometimes there is limited time to respond to the project team's requests for feedback and this is difficult for us, especially finding the time to get together on it. We actually missed one deadline.*
- *Time pressure is a big factor.*
- *This is just me – email is not feasible for a classroom practitioner because I just don't have the time to access it. I would prefer 5 minutes on the phone at lunchtime and have access to hard copy to take home. It is not that I am not computer literate – It's just the pressure of other things – not enough time in the day.*

## **2.2 Review of email communication**

As part of the development process, the project team established email communication with the trial and development teachers (the teachers' mailing list). A study of the use of the mailing list revealed limited communication from the participating teachers. In 10 months, a total of 50 communications were made, but the vast majority of these came from the project team. Only one teacher initiated comment. The teacher's comment was not attended to on the list. It may have been handled externally, but if it had been noted to participants it may have demonstrated the value of teacher-initiated forums.

The vast majority of communication consisted of requests from the project team for feedback on specific topics relating to sections of the materials. Most of the remainder consisted of reminder notices for workshops and due dates for feedback. Replies to requests for comment and feedback were received from only a couple of teachers via email. Most of the teachers did not take the opportunity to share their expertise and experiences using the mailing list.

## **2.3 Summary and Conclusions**

The interviews indicated strong support for the work of the project team but some concerns emerged over the time pressure involved with providing feedback on successive drafts. Some welcomed the extension of the project timeline. Some concerns were expressed about assessment and reporting and a few of the teachers referred to uneven progress through the year.

The majority of the schools had not attempted to implement the materials, but considerable activity had occurred in six of the 14 schools. Six of the 14 schools had implemented the draft curriculum in at least one Year level. Another six schools had provided comment to the project team but not attempted to apply the materials to planning or teaching. Two schools had commenced planning activities but had not begun to apply the materials in the classroom.



Communication by email was convenient for some but by no means all teachers. Many preferred telephone contact. Finding time for contacting the project team was a common problem. A review of email via the mathematics teachers' mailing list found only limited communication from the teachers using this medium with few availing themselves of the opportunity provided to share experiences and opinions with others.

The use of the email list as a forum for communication should be encouraged for its efficiency in terms of both immediacy of response and effort required. The limited use of the list means the loss of a great deal of valuable information. The interviews suggest, however, that teachers are restricted in their access to email and the time they have available for communication.

We conclude that:

By the beginning of Semester Two 2001, the project was progressing well. Teachers generally appreciated the efforts of the project team and the account taken of teacher comments and suggestions. Response to the staged implementation of the materials was positive. Overall, the teachers indicated a feeling of control over the development of materials, appreciating the acknowledgment and inclusion of much of their feedback to the team. There was also evidence of frustration among some of the teachers with the pressure of deadlines for responses to drafts and the time needed outside of classroom hours for communication with the project team.

### 3. Appropriateness – Views of Mathematics Education

#### Focus Question 2

To what extent do the draft curriculum materials reflect current and emerging views of education and of educators in mathematics?

#### 3.1 External Review

The results of the external review are summarised below, indicating the appropriateness of the draft curriculum in terms of the 11 issues, according to the major stakeholders.

The responses of the draft curriculum to two of the issues were seen as appropriate by all three stakeholders, as shown in Display 2:

#### Display 2: Issues for which curriculum seen as appropriate

Issue	Summary of Comments
4. The role of language in mathematics	<ul style="list-style-type: none"> <li>Allowing students to experiment with ways of describing maths ideas seems a logical follow-on from focus on mental computation (A)</li> <li>Notion of 'deeper understanding' critical if students to cope effectively with requirements of 'conventional &amp; formalised' language (A)</li> <li>Focus on language throughout will help with incorporating Working Mathematically into strands (C)</li> </ul>
9. The role of learning technologies	<ul style="list-style-type: none"> <li>Essential to incorporate technology in a range of forms (A)</li> <li>Need to get away from drill software (A)</li> <li>Crucial for a syllabus that becomes effective from 2004 (C)</li> </ul>

[A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland; Summaries of comments shown. Full comments in Appendix 4.]

For six of the issues, listed in Display 3, all three stakeholders indicated appropriateness, but at least one indicated reservations, shown in italics:

#### Display 3: Issues for which curriculum seen as appropriate with reservations

Issue	Summary of Comments
1. The forms and roles of assessment and reporting	<p><i>Reservations (E, C)</i></p> <ul style="list-style-type: none"> <li><i>Flagged as major issues by teachers (E)</i></li> <li><i>Employing authority to develop reporting framework – should not be an issue for project team (E)</i></li> <li><i>Practical ideas should be included in support materials (E)</i></li> <li><i>Team grappling with the reporting issue (C)</i></li> </ul>
2. Catering for diversity in the teaching of mathematics	<p><i>Reservations (E, A)</i></p> <ul style="list-style-type: none"> <li><i>Strategies &amp; learning styles not clearly identified &amp; addressed (E)</i></li> <li><i>Particularly relevant for Early Childhood, Middle Years &amp; Senior Schooling (E)</i></li> <li><i>Rationale could flag, &amp; support materials could elaborate, dichotomies like closed vs. open activities; passive vs. active engagement; procedural vs. meaningful tasks; didactic vs. constructive strategies (E)</i></li> <li><i>Concern that outcomes &amp; elaborations could be taught in isolation from maths understandings in real life contexts (A)</i></li> </ul> <p>Appropriate (C)</p> <ul style="list-style-type: none"> <li>This issue taken into account as much as possible now (C)</li> </ul>

[A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland; Summaries of comments shown. Full comments in Appendix 4.]

### Display 3 (Continued)

Issue	Summary of Comments
7. The nature of numeracy and its place in the mathematics key learning area	<p><i>Reservations (A)</i></p> <ul style="list-style-type: none"> <li><i>Maths is more than providing the tools for numeracy – it is developing understanding of where, how, why to use those tools – is this numeracy? (A)</i></li> </ul> <p>Appropriate</p> <ul style="list-style-type: none"> <li>Difficult topic – seen by many teachers as the domain of maths &amp; if syllabus emphasises numeracy more than other syllabuses this view will be reinforced (C)</li> <li>Working mathematically will be where the numeracy lies (C)</li> </ul>
8. The place of realistic mathematics	<p><i>Reservations (E)</i></p> <ul style="list-style-type: none"> <li><i>Not the role of the syllabus (E)</i></li> <li><i>Application of knowledge &amp; skills to a realistic context the responsibility of the teacher – to assist teachers, practical applications &amp; identification of realistic, appropriate contexts needs to be a priority for support materials (E)</i></li> <li><i>Mapping of the sequence of outcomes across all KLAs &amp; the application of maths knowledge &amp; skills within the other KLAs should be considered (E)</i></li> </ul> <p>Appropriate (A, C)</p> <ul style="list-style-type: none"> <li>Surely this is at the heart of maths teaching &amp; learning – what point to such a practical subject if not to teach it within real &amp; meaningful contexts? (A)</li> <li>May still be a problem with teaching concepts in isolation (A)</li> <li>Which comes first – surely recognition of a real situation or problem, consideration for how to solve problem &amp; the concepts, tools &amp; thinking needed to solve it (A)</li> <li>Best place for this will be in support materials (C)</li> </ul>
10. Practicality for teachers: the ease with which teachers can understand and learn to use the new curriculum	<p><i>Reservations (E, A)</i></p> <ul style="list-style-type: none"> <li><i>Current collaborative review process should assist in addressing this issue but initial review by EdData showed implications for teacher planning was question that elicited greatest spread in teacher responses (E)</i></li> <li><i>Support materials as yet unseen so not possible to assess the practicality for teachers (E)</i></li> <li><i>Issue has implications for teacher training, professional development &amp; syllabus implementation plan (E)</i></li> <li><i>For teachers in classrooms it can look very systematic &amp; easy to ‘check off’ elaborations one after another – fear that this may not bring out understanding, transfer of learning or the interrelatedness of different outcomes for learners (A)</i></li> </ul> <p>Appropriate (C)</p> <ul style="list-style-type: none"> <li>Teachers, secondary &amp; primary, finding syllabus useful (C)</li> </ul>
11. Continuity with current programs (1-10, 11-12)	<p><i>Reservations (E, A)</i></p> <ul style="list-style-type: none"> <li><i>Old 1–10 syllabus &amp; support materials were not adopted by secondary schools leaving gap at the 7–8 interface (A)</i></li> <li><i>A syllabus that is continuous from P or 1–10 must be accepted, adapted &amp; used by both primary &amp; secondary (A)</i></li> <li><i>If teachers continue to use the old syllabus will there be a change in the current situation in relation to Year 7 &amp; 8? (A)</i></li> </ul> <p>Appropriate (C)</p> <ul style="list-style-type: none"> <li>Has been a project team focus &amp; is getting much closer (C)</li> </ul>

[A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland]

For three of the issues, listed in Display 4, at least one of the three stakeholders indicated that the responses of the draft curriculum were not appropriate (reservations shown in italics, not appropriate in bold):

**Display 4: Issues for which draft curriculum response not seen as appropriate**

Issue	Summary of Comments
3. The relative emphasis between mental computation and standard written forms	<p><b>Not appropriate (E)</b></p> <ul style="list-style-type: none"> <li>• <b>Present outcome statements do not show emphasis on mental computation in the early years – highlighted in elaborations but not mandated &amp; not to be included in the syllabus (E)</b></li> <li>• <b>Current process of collaborative review of outcome statements may address this issue (E)</b></li> </ul> <p><i>Reservations (C)</i> Appropriate (A)</p> <ul style="list-style-type: none"> <li>• Idea of developing mental computation in young learners suggests a focus on thinking about maths &amp; hopefully the development of understanding – this needed to change attitudes to maths &amp; enable learners to develop range of strategies for mathematical modelling &amp; problem solving (A)</li> </ul>
5. Mathematics curriculum for the middle years of schooling	<p><b>Not appropriate (E)</b></p> <ul style="list-style-type: none"> <li>• <b>Statement indicates developmental nature of maths concepts &amp; skills but not development of the learner (E)</b></li> <li>• <b>Age appropriateness of the content must be considered (E)</b></li> <li>• <b>Include statements on needs of students in Early Childhood, Middle Years &amp; Senior Schooling in syllabus introduction (E)</b></li> </ul> <p><i>Reservations (A)</i></p> <ul style="list-style-type: none"> <li>• <i>Learning outcomes show developmental nature of maths but are only successful if the maths is placed in contexts where application, communication &amp; understanding can be demonstrated (A)</i></li> </ul> <p>Appropriate (C)</p>
6. Teachers' understanding of mathematics education	<ul style="list-style-type: none"> <li>• <b>Not appropriate (E)</b></li> <li>• <b>Not the role of the syllabus – teacher training institutions &amp; employing authorities should be responsible (E)</b></li> <li>• <b>Appropriate teacher training, professional development &amp; a clear implementation plan required (E)</b></li> <li>• <b>Possible that elaborations may be interpreted as the content &amp; indicators of outcomes &amp; viewed by non-maths trained teachers as 'the path' rather than the 'guide posts' (E)</b></li> <li>• <b>Further development of core content may assist here (E)</b></li> </ul> <p><i>Reservations (A)</i></p> <ul style="list-style-type: none"> <li>• <i>Outcomes &amp; elaborations if taken as isolated steps could be 'taught' &amp; checked off without learning transfer &amp; understanding taking place (A)</i></li> </ul> <p>Appropriate (C)</p> <ul style="list-style-type: none"> <li>• A real strength of the current format of the draft syllabus which is well liked by teachers (C)</li> </ul>

[A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland]

The response of the draft curriculum to issues related to the roles of language and learning technology were seen as appropriate by the major schooling authorities (Education Queensland, Queensland Catholic Education Commission and Association of Independent Schools of Queensland Inc.).

Some reservations were expressed by at least one of the major stakeholders about the draft curriculum's response to several issues:

- The forms and roles of assessment and reporting
- Catering for diversity in the teaching of mathematics
- The nature of numeracy and its place in the mathematics key learning area
- The place of realistic mathematics
- Practicality for teachers
- Continuity with current programs.

One of the major stakeholders (Education Queensland) did not accept as appropriate the draft curriculum responses to:

- The relative emphasis between mental computation and standard written forms
- Teachers' understanding of mathematics education
- Mathematics curriculum for the middle years of schooling.

The reservations and concerns expressed in the external review are difficult to summarise, but the following points emerge:

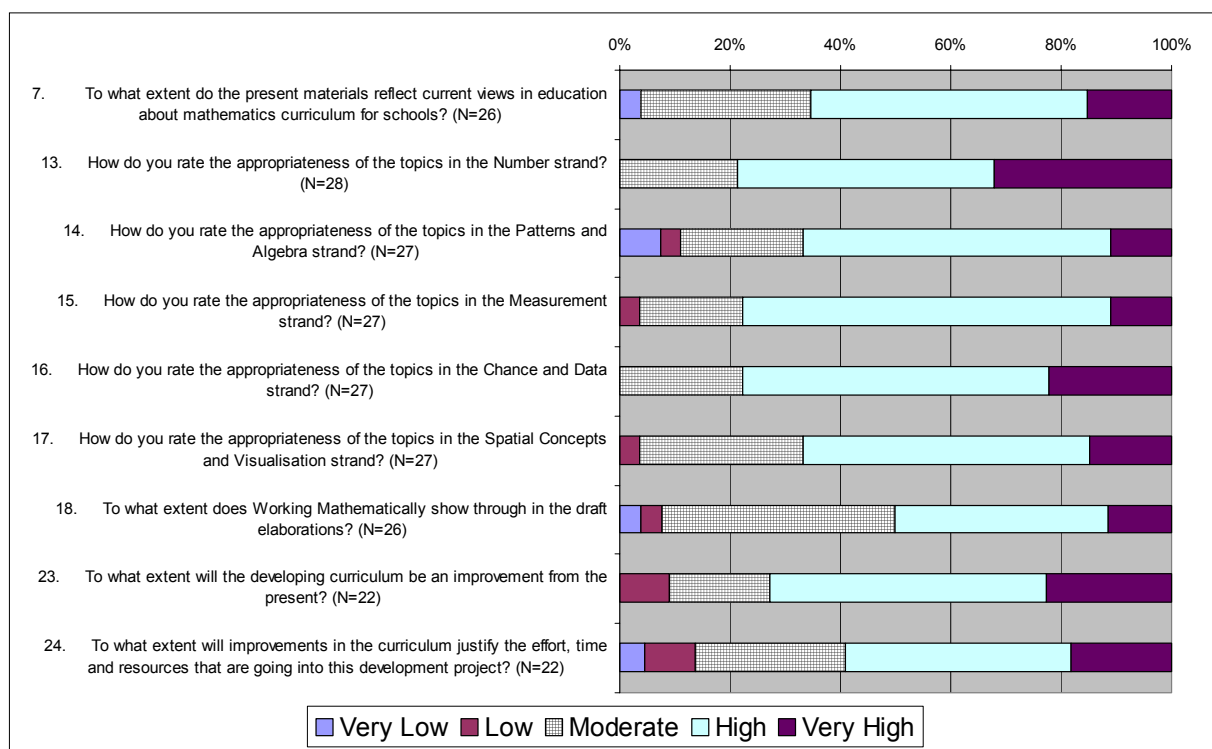
- Education Queensland was responsible for all three ratings of 'not appropriate'. Reservations were made in five cases by Education Queensland and six cases by Association of Independent Schools of Queensland Inc. Queensland Catholic Education Commission indicated only two reservations.
- Education Queensland expressed concerns that mental calculations were not specifically emphasised in the early years, that the syllabus introduction did not specifically refer to the needs of learners at different stages of development, and that elaborations might not necessarily be interpreted as guides to the sequence of development of mathematics concepts.
- Education Queensland expressed reservations that assessment and reporting issues were not yet resolved and that more could be done to provide guidance for teaching for diversity.
- Association of Independent Schools of Queensland Inc. expressed reservations that teachers could teach the outcomes and elaborations in isolation from the broader purposes of mathematics teaching and important pedagogical considerations, and that the Year 7–8 interface may present problems where the present 1–10 syllabus had not been adopted in secondary Year levels.
- Although reservations were expressed, for the most part the three schooling authorities appear to accept most of the responses of the draft curriculum to the range of issues identified in the external review. Some issues remain to be resolved, mainly with Education Queensland.

### **3.2 Survey**

Among the items on the survey, six were grouped as representing aspects of appropriateness (items 7 and 13 to 17). Another three items are included here as being relevant to the issue of appropriateness (items 18, 23 and 24).

The responses to each of these items are summarised in Display 5.

**Display 5: Survey Items 7, 13–18, 23–24 (Appropriateness)**



The results for item 7 indicate that most of those who responded thought the draft materials reflected current views in education about mathematics curriculum for schools, with over 60% indicating to a high or very high extent. This result can be taken as broad recognition that the draft curriculum is generally in line with current trends and thinking.

The results for items 13 to 17 indicate that over 60% of those who responded rated the topics in each of the strands as highly or very highly appropriate. Low or very low ratings were given by very few, peaking at three of the 27 valid responses for the Patterns and Algebra strand. These three responses all came from secondary teachers. Two strands were rated less highly for appropriateness of topics: the Patterns and Algebra strand and the Spatial Concepts and Visualisation strand. The results taken together indicate that the current topics were seen as appropriate by most of the teachers participating in the trial and development phase. The analysis set out in Appendix 5 indicates no significant difference between trial teachers and others on this set of items.

The results for item 18 indicate some level of doubt about the extent to which Working Mathematically shows through in the draft elaborations. Half of the valid ratings were high or very high. Most of the other ratings were moderate. Ratings were higher for the primary teachers and those who had been trial teachers (as shown in Appendix 5).

The results for items 23 and 24 indicate that most of the trial and development teachers believed that the developing curriculum would be an improvement from the present. A few had doubts that improvements in the curriculum would justify the effort, time and resources that were going into the development project. The trial teachers were more likely than the non-trial teachers to consider the draft curriculum

to be an improvement that justifies the effort, time and resources (as shown in Appendix 5).

### 3.3 Summary and Conclusions

The external review results indicate that:

- Education Queensland expressed concerns that mental calculations were not specifically emphasised in the early years, that the syllabus introduction did not specifically refer to the needs of learners at different stages of development, and that elaborations might not necessarily be interpreted as guides to the sequence of development of mathematics concepts.
- Education Queensland expressed reservations that assessment and reporting issues were not yet resolved and that more could be done to provide guidance for teaching for diversity.
- Association of Independent Schools of Queensland Inc. expressed reservations that teachers could teach the outcomes and elaborations in isolation from the broader purposes of mathematics teaching and important pedagogical considerations, and that the Year 7 and 8 interface may present problems where the present 1 to 10 syllabus had not been adopted in secondary.
- Although reservations were expressed, for the most part the three schooling authorities appear to accept most of the responses of the draft curriculum to the range of issues identified in the external review.

The interview results indicate:

- Broad recognition that the draft curriculum is generally in line with current trends and thinking
- General support for the appropriateness of the current topics
- High but far from universal belief that Working Mathematically shows through to a satisfactory degree in the draft elaborations

The teachers who had taken part in the trial in 2000 were more likely than the non-trial teachers to consider the draft curriculum to be an improvement that justifies the effort, time and resources.

We conclude that:

Taken together, the results can be interpreted as broad recognition that the draft curriculum is generally in line with current thinking about mathematics and mathematics education. Most of the teachers saw the current topics as appropriate and believed that the developing curriculum would be an improvement over current programs. For the most part, the three school authorities appear to accept most of the responses of the draft curriculum to the range of issues identified in the external review, but some reservations and concerns remained. Education Queensland expressed concerns that mental calculations were not specifically emphasised in the early years, that the syllabus introduction did not refer to the needs of learners at stages of development, and that elaborations might not necessarily be interpreted as guides to the sequence of development of mathematics concepts. Education Queensland expressed reservations that assessment and reporting issues were not yet resolved and that more could be done to provide guidance for teaching for diversity. The Association of Independent Schools of Queensland Inc. expressed reservations that teachers could teach the outcomes and elaborations in isolation from the broader purposes of mathematics teaching and important pedagogical considerations, and that the Year 7 and 8 interface may present problems where the present 1 to 10 syllabus had not been adopted in secondary levels. We

believe, however, that consultation between the project team and the three school authorities should be able to resolve these reservations and concerns.



## 4. Appropriateness – Potential to Meet Needs in Schools

### Focus Question 3

To what extent do the draft curriculum materials satisfy the identified needs of all students, teachers and school administrators?

#### 4.1 Interviews with trial and development teachers

The interview included questions on various characteristics of the school including the school's viewpoint on teaching mathematics and its place in the curriculum. Two items were concerned with appropriateness of the draft materials: one asked about compatibility with the school's viewpoint on mathematics and the other asked about adaptability to students' needs and abilities.

##### 4.1.1 How compatible are the present materials with your school's viewpoint on the teaching of mathematics and its place in the curriculum?

The responses were varied, but almost all saw high levels of compatibility between the views of the schools and those in the new curriculum documents.

- *They line up well, especially the core learning outcomes. Also the KLA outcomes – we like these in particular.*

In some cases, the draft curriculum was compatible with the way primary schools integrated curriculum. In other cases, compatibility was linked to familiarity with the outcomes approach in other key learning areas. Others saw compatibility in the high status of mathematics in the curriculum. Some saw the ways in which mathematics was taught in the school being valued in the new syllabus.

- *We have five hours per week where a hands-on approach is valued and mental computation is a priority. The new materials are quite compatible. We focus on selecting and applying knowledge, not just on learning for learning's sake.*
- *Our viewpoint is changing in that maths is being integrated more often into the other KLAs and not just seen as maths separately in its own time slot. It seems to be very compatible.*

Two respondents recognised that the existing views within the school were 'traditional' and that the new curriculum documents were 'very compatible' with the views of the school. Such comments imply that there is minimal change being expected of the schools, teachers or administrators:

- *It is not really different from the old curriculum and it fits quite comfortably.*
- *They work well together. We don't have to get new material or change the way we teach.*

One teacher suggested that the school needed to change its views on mathematics education and the draft curriculum would force this, which was seen as a positive step. Another indicated that, although the school viewpoint was consistent with the draft materials, this view was not shared by all teachers in the school.

- *The school's viewpoint will have to change to accommodate the materials. This is a good thing. The program will change. Teachers' viewpoints, pedagogy etc., may be slower to change.*
- *The school's viewpoint is consistent with the QSCC on the teaching of maths and its place in the curriculum. There are pockets of resistance from individual teachers but we get that all the time.*

One secondary teacher aired concerns about the values of the school not being evident in the new curriculum. The school emphasised 'academic rigour' in its marketing profile and the teacher reported:

- *There are some definite viewpoints in the school about mathematics and mathematical rigour and to some the standards of old seem to be slipping. The difficult stuff seems to be put back further and further into the higher grades and that is a bit of a worry.*

Four comments related to the levelling of some content areas. In some schools there was compatibility in levelling, in others there were differences. Some noted differences but did not seem to see them as an issue. Comments suggested that while some of the outcomes and elaborations may not match the levels at which the students were working in their schools, there was scope within the curriculum for flexibility. The diversity in responses is evident in the comments below:

- *The idea of levels is fitting in very well with the way we plan to set up our senior school next year.*
- *It lends itself well to working above or below according to the level of the students. We are very much into a differentiated curriculum and levels lend themselves to that.*
- *They are bringing back some work to earlier levels than at present. It brings a different time scale for us. There may be good reasons for doing it that way.*
- *Because the philosophy of the school is outcomes based it fits in well. In some areas of mathematics the school has raised the level of outcomes, for example in algebra and measurement, we do work at a lot higher level from level 3 on.*

#### **4.1.2 How adaptable is the draft curriculum to the needs and abilities of the students in your school?**

Most of the teachers indicated that the draft curriculum could meet the needs and abilities of the students within the schools. This was for all schools regardless of the backgrounds of the attending students. Primary and secondary teachers from the wide range of communities involved believed that the outcomes approach of the draft curriculum offered the flexibility to adapt learning to suit student needs. This was seen as a definite advantage of the approach. Teachers commented that they could plan the content to meet the needs and abilities of their students or adapt practices (such as streaming, grouping and open-ended tasks) to suit their particular students. Some teachers indicated that planning using outcomes caused them to focus on the students' needs and levels of understanding and plan learning to meet those needs.

Some responded from a philosophical level:

- *The philosophy of outcomes based education means that you can cater for the individual students' needs.*

Others took a more pragmatic view and linked it to their experiences of planning using the draft curriculum:

- *Because of the nestedness of the elaborations, if you have students working at a particular level or outcomes, you can easily see what is required at the next level.*

The comments of some secondary teachers included the notion of streaming. The structure of the curriculum with the focus on students' levels of understanding provided a means by which students could be grouped. This was seen as a positive pedagogical tool for this level of schooling:

- *It enables us to say whether they have achieved level 4 or 5. It allows us to stream students, which is good. We have a whole range of abilities here and it is great to be able to work with the kid's ability.*

While less overtly focusing on streaming, a primary teacher offered a similar level of support for the document in this area:

- *We find that if you want to do group work it lends itself quite easily to working with groups. Children who are bright can be pushed ahead, and the students at the other end can take their time.*

Others suggested that the flexibility offered with the outcomes approach allowed them to adjust the curriculum to suit their students' current level:

- *The draft curriculum is adaptable. We are working from Level 3 through to level 6+ at the moment. We can move up and down from where the kids are.*

However, within the notion of flexibility, one teacher commented that the perception of flexibility and benchmarking at minimum standards could be seen to be limiting to the 'bright students':

- *It's written for flexibility. Benchmarks are the bare minimum. There is a concern that the syllabus is tailored for the bare minimum standards. What about the G&T or just bright students?*

The structuring practices of the secondary school were noted to be a constraint with organising curriculum planning and delivery. In the comment below, the teacher raises concerns about how the curriculum can be tailored to meet the needs of students, but without other supporting practices being implemented in the school, there is little chance of revisiting content covered.

- *There is also the issue that if they are not successful at this level, how do they revisit in subsequent years? It seems the vertical timetable is the way to go but it is not the case here and the whole revisiting stuff is not being addressed well. Schools may resist going in certain ways that may be needed to do the syllabus well.*

Overall, the support for the draft syllabus to cater to the needs of students was very evident. Teachers were able to adjust their programs to meet student needs since the outcomes and elaborations were seen to be organised in ways that linked to students' levels of understanding. Learning experiences that would consolidate and extend their levels of understanding could be planned. A few of the comments seemed to indicate misunderstanding of the outcomes approach including the function of level statements, pointing to the need for initial in-service to cover these basic concepts.

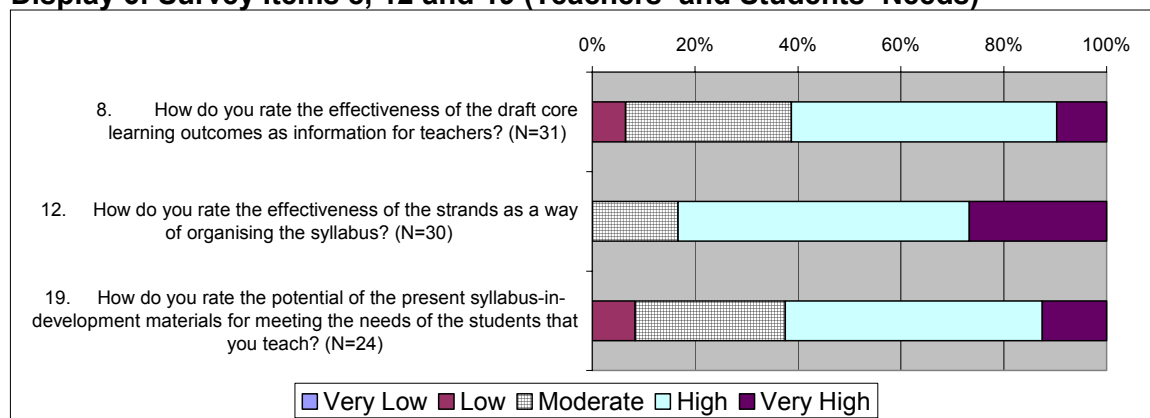
## **4.2 Survey**

Three survey items related to teachers' and students' needs: Items 8, 12 and 19. These items, and the ratings for each, are shown in Display 6.

No very low ratings were found for any of the items. There were two low ratings for items 8 and 19 each. Most ratings were high or very high. These results indicate that the draft materials were clearly effective in meeting the needs of teachers and had

good potential to meet the needs of the students in the range of schools participating in the trial and development phase.

**Display 6: Survey Items 8, 12 and 19 (Teachers' and Students' Needs)**



### 4.3 Summary and Conclusions

In the interviews, most of the teachers reported high levels of compatibility between the viewpoint on mathematics education evident in the draft curriculum documents and that held by their schools.

The teachers indicated very strongly that the draft curriculum would be able to meet the needs and abilities of the students within their schools. This result held for all schools regardless of the backgrounds of the attending students. Primary and secondary teachers from the wide range of communities involved believed that the outcomes-based approach of the draft curriculum offered the flexibility to adapt learning to suit student needs. Teachers' comments suggested that while the outcomes and elaborations may not always match the levels at which the students were working in their schools, there was scope within the curriculum for flexibility.

The survey results indicated that the draft materials were clearly effective in meeting the needs of teachers and had good potential to meet the needs of the students in the range of schools participating in the trial and development phase.

We conclude that:

The draft materials were clearly effective in meeting the needs of teachers and had good potential to meet the needs of the students in the range of schools participating in the trial and development phase.

## 5. Appropriateness – Implications for Draft Materials

### Focus Question 4

In the light of answers to the above, what changes, if any, might be made to the intent and content of the draft curriculum materials?

### 5.1 Interviews with trial and development teachers

Interview questions 9a and 9b asked the teachers for suggestions to improve the draft core learning outcomes and the draft elaborations.

#### 5.1.1 Question 9a: What suggestions do you have for improving the draft core learning outcomes?

Most of the teachers were satisfied with the draft core learning outcomes as they were:

- *When I read them I couldn't see that they would need improvement.*
- *We think this has been addressed well at the recent Conference.*
- *Not at the moment other than to spread them out a bit.*

Only two teachers had specific suggestions to improve the outcomes:

- *Include more 'explain' at Levels 1 & 2.*
- *At the cluster meeting they produced all the core learning outcomes at all the levels on one A3 sheet. That is the most significant advance they have made in the last 12 months (and that is not being cynical). For the first time ever a teacher can look at one sheet of paper and see the whole maths program.*

A few teachers stated that contact between the Project Team and groups of teachers was the effective way to improve outcome statements:

- *It's essential to have contact with teachers from other schools.*
- *Continued sessions where teachers sit down and go through them.*

### 5.2 Discussion

The results of the interviews and survey suggest that some level of doubt persisted about the extent to which Working Mathematically shows through in the draft elaborations. Another concern from some of the teachers was that some content areas were set at levels that were too high or too low.

The external review involving the major stakeholders revealed reservations about the draft curriculum's response to some issues. Those related to appropriateness were opinions that:

- mental calculations were not specifically emphasised in the early years
- the syllabus introduction did not specifically refer to the needs of learners at different stages of development.

### 5.3 Summary and Conclusions

Teachers were generally satisfied with the draft materials, noting that improvements were best made by the medium of face-to-face discussion involving teachers and project team members in school visits and cluster conferences. Some doubts persisted that Working Mathematically was not showing through clearly in the draft elaborations. Some teachers did not agree with the level placement of some content.

The external review involving the major stakeholders elicited suggestions that mental calculations should be included in the earlier years and that the syllabus introduction should specifically refer to the needs of learners at different developmental stages.

We conclude that:

Further development of the draft materials should focus on:

- Modifying the elaborations to bring out Working Mathematically more clearly
- Re-examining the level placement of content
- Considering the inclusion of mental calculations at the early levels
- Describing students' needs at different stages of developing mathematical concepts.

## 6. Effectiveness – Planning, Teaching and Learning Contexts

### Focus Question 5

How effectively will the draft curriculum materials be applied in planning, teaching and learning contexts?

### 6.1 Interviews with trial and development teachers

Due to the nature of the trial and development process, many of the teachers had not made attempts to use the materials in planning or teaching, therefore many of the interview responses were based on their inspection of the draft materials. In order to gauge the extent to which teachers had used the materials, Interview Question 7 asked what the teachers had done with the draft materials to date. The results, shown in section 2.1.3, indicate that six of the schools had attempted implementation in at least one Year level, two had attempted planning, and the other six had not tried to implement the draft materials in any systematic fashion.

The results of item 8 should be interpreted with this result in mind. This item asked 'What can you say about your experiences with the draft materials so far?' leading to the four questions discussed below.

#### 6.1.1 Question 8a: What do you like about the draft materials?

Teachers reported liking many aspects of the draft curriculum materials, including the:

- Organisation and format (13 comments)
- Suggestions for activities provided by the elaborations (three comments)
- The clear explanation of core content, outcomes and elaborations (12 comments)
- Similarity with current programs (three comments).

Many of the teachers found the document well organised and presented:

- *Terminology is also easy to follow. Explanations are given where needed. A young teacher could pick it up and understand it readily with minimal assistance.*
- *Concise, point form, worthwhile activities and the inclusion of core content.*
- *I like the way the syllabus content, elaborations and strands are set out. I find this clear to work with — it is concise and clear yet allows schools to approach it in different ways.*
- *The layout — three columns — outcomes easy to understand.*
- *They are very well sequenced and easy to understand and most importantly they make sense, not only to us but also the students.*

These are very important points given that the structure of the mathematics draft syllabus differs from the other key learning areas. Mathematics as a discipline has a unique structure and this is probably connected with the way the draft syllabus has been structured. The fact that teachers have been able to use this structure tends to provide justification for the difference.

Some liked the provision of support ideas, materials and activities for teachers:

- *The outcomes are written in a way that suggests activities.*
- *It will contain lots of teacher support materials.*

Most of the teachers liked the way that core content, outcomes and elaborations are well explained:

- *The elaborations make it quite clear about what we should teach.*
- *I like the way the elaborations are written in a well-defined and straightforward way. It is good that the content is included in the elaborations.*
- *Learning outcomes are explicit. The outcomes are transparent for parents, students and community. It is all very clear.*
- *The elaborations and outcomes are a wonderful management tool for maths teachers.*

Three teachers appreciated similarity with the current program:

- *The content is similar to the present syllabus.*
- *There hasn't had to be a change in the teaching to incorporate the outcomes. It is like the net at the lower levels and you don't have to struggle with it.*
- *Outcomes can be met with current teaching methods.*

Three commented on more theoretical aspects:

- *They are new and reflect current philosophies, pedagogies. They look at what kids know or do and not what they can't.*
- *We just like the fact that we have a set of specific objectives that we can see from Years 1 to 10.*
- *I love the fact that they are moving more of the abstract stuff to the high school.*

### **6.1.2 Question 8b: What concerns or doubts do you have?**

The main concern related to the order in which topics are arranged. Other concerns related to assistance needed for planning, assessment and reporting.

Many said that the order of content needs further work to match student capabilities more closely with each level (8 comments):

- *Having no deductive geometry in level 5 is a mistake. The distributive law in algebra should come in earlier, in level 5, not 6.*
- *I have doubts about the amount of content and elaborations in levels 1 to 4 compared to the other levels. There seems to be a lot there for primary school to cover. I think they could put more into the high school, spreading the content out, so that there is time to give students a firm grounding in the primary years.*
- *I think there is still some uncertainty over the outcomes and levels that they have not been sequenced as well as we would like.*
- *The only concern is that some of the strands or topics seem to be fairly easy and I wonder where the extension is coming for the good kids. I don't know if that is a justifiable concern or not.*
- *Some of the topics have been deferred to later years than at present and I am not sure that this is necessarily wise.*

Some felt that they would need help with planning using the new materials (6 comments):

- *My only concern using levels is that in planning, it takes a lot of time to find out where all the kids are and then plan a unit using all the levels or three different units. It seems to be a daunting task, especially where there is a wide range as in my class.*
- *What I liked previously was the way the concept areas were presented with all the levels on one page and now it is not available that way.*



- *The updating makes it difficult for us. We work out a program and then outcomes or format change. It is hard to fit it together into a program — there have been no guidelines on right or wrong approaches to implementing it. It is incredibly time consuming to plan. Every outcome has so many elaborations, and we got caught looking too much at the elaborations instead of the global outcomes.*

A few said they would need help with assessment and reporting (seven comments):

- *I am not sure how we are going to go about reporting to parents, or how we are going to go as a whole school. We don't want school reports to be overly large documents.*
- *The only concern I have is with assessment and reporting, but it is getting closer to resolution. We are exploring alternative ways to report to parents in this school.*
- *The issue of reporting — I don't like the idea of there being such a diverse way of reporting the outcomes. This will make it hard to make comparison when a student moves from school to school.*
- *So many elaborations that it is an assessment nightmare. This becomes more of an issue as you move up the school Year levels. By the time you get to Year 10 you have the five strands embedded in the one question so how do you decipher what part of it students are demonstrating?*

Two teachers were concerned that the final syllabus would not include the elaborations:

- *We may not have access to the elaborations in the Syllabus.*
- *Will the elaborations appear in the Syllabus? We want them.*

### **6.1.3 Question 8c: What has been easy to understand?**

The responses to this item indicate that the draft materials generally, and in particular the elaborations, are quite easy for teachers to understand.

Many of the teachers specifically mentioned the elaborations (five comments):

- *The elaborations. These give an overview and a statement of what you want to achieve. They are quite specific and so easy to use.*
- *The elaborations are easiest, and that is important because this is what teachers will use.*
- *I have found the elaborations are really good and make planning easy.*

Some mentioned the rationale, the outcomes or the core content (three comments):

- *The outcomes are easy to understand.*
- *The core content.*
- *The rationale is especially clear. I could sell this program to anyone. The rationale is hard to argue against because it is so clear and educationally sound.*

Several teachers found that the layout of the materials makes them easy to understand (7 comments):

- *The format aids understanding.*
- *The structure of it — the organisation of the document. It has been easy to see the progression of outcomes from level to level.*
- *The whole document flows well and is very easy to understand. There are different ways to access it (different formats).*
- *The natural progression through the levels of the topics. Everything is sequenced well.*

One teacher appreciated that the draft syllabus was consistent with the format of other Queensland School Curriculum Council syllabuses and another appreciated the absence of 'jargon':

- *The consistency with other QSCC syllabuses.*
- *The language — not a lot of jargon.*

Some said that all of the draft materials were easy to understand (four comments):

- *All of it.*
- *Everything.*
- *It is an easy program to read through and so on.*

#### **6.1.4 Question 8d: What has been difficult to understand?**

A majority of the teachers found no difficulty, but some had problems with the wording and the terminology in the core learning outcomes.

Many said that all of the materials were easy to understand (nine comments):

- *Nothing. The document is user friendly for teachers.*
- *I haven't found anything difficult to follow yet. It is a much easier document to understand than science.*
- *We have had no difficulty at all, and I am very happy with what they have done. It is a breath of fresh air compared to Science and HPE and SOSE.*

One thought that teachers' prior knowledge could colour the meanings and interpretations:

- *Teachers' prior knowledge and individual interpretations colour the meaning. Perceptions differ.*

Two found it difficult to determine appropriate levels for students:

- *Sometimes finding out which level children are on, especially at the start of the year.*
- *Where do kids fit into certain levels? For example we had expectations that our starting year 8s would be at levels 4 or 5 but the majority have been levels 3/4. It has been difficult to match the skills and abilities of the children to the appropriate level.*

Five teachers (including two primary and three secondary) found difficulty with the outcomes, particularly in the use of terms. For example:

- *Some of the KLA outcomes are worded too broadly and stated in academic terms. This is not a great concern as long as you have the elaborations.*
- *The only difficulties we have had were with some of the terms, but the project team has been definite that there are good reasons for this choice of terms.*
- *Some of the wording is difficult to follow especially if you are not a maths specialist.*

Two found some of the elaborations hard to understand:

- *Some elaborations in the algebra strand. Some elaborations in the location/direction strand.*
- *Elaborations are difficult to understand. Some are out of place (don't match the outcome or seem out of sequence) and some of the verbs don't seem to match.*

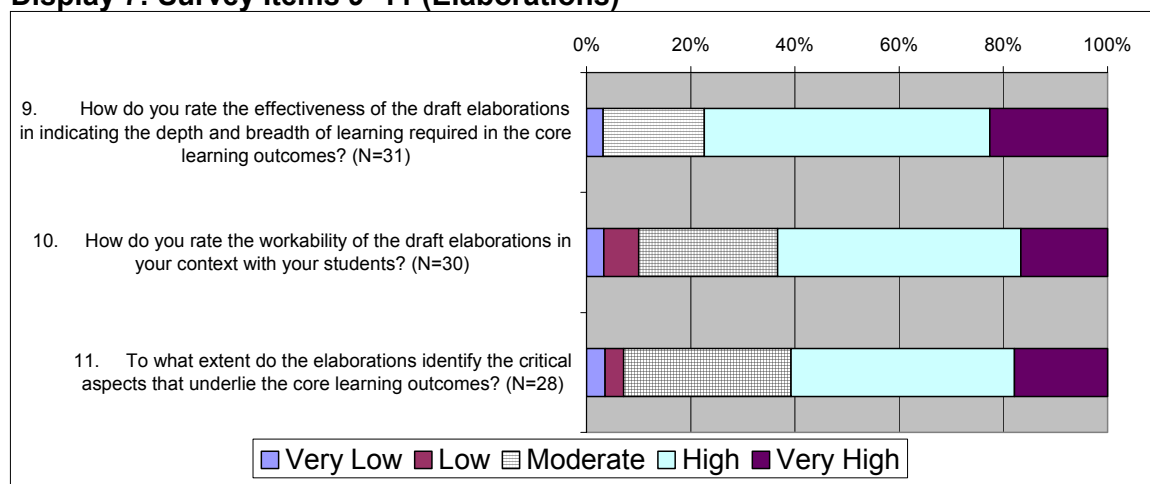
Two reported difficulty with assessment or reporting:

- *How meaningful information is going to be reported to parents.*
- *How to assess the outcomes.*

## 6.2 Survey

Three of the survey items are relevant to this focus question: Items 9, 10 and 11, which refer to the use of the elaborations in planning processes. The results are shown in Display 7.

**Display 7: Survey Items 9–11 (Elaborations)**



The elaborations drew high approval. Most of the teachers (24 of 33) saw the draft elaborations as highly or very highly effective in indicating the depth and breadth of learning required in the core learning outcomes. A smaller majority gave high or very high ratings to the workability of the draft elaborations (19 of 33) and the extent to which they identify the critical aspects of the core learning outcomes (17 of 33).

Considering that many of the teachers had not attempted to apply the elaborations at the time of the survey, this result has to be taken as an interim guide. A reasonable conclusion is that in their current form, the elaborations provide a sound, workable basis for planning or learning–teaching activities.

## 6.3 Summary and Conclusions

Teachers reported liking many aspects of the draft curriculum materials, including the:

- Organisation and format
- Suggestions for activities provided by the elaborations
- The clear explanation of core content, outcomes and elaborations
- Similarity with current programs.

A few teachers felt that they would need help with planning using the new materials, some finding difficulty with the wording and terminology in the draft elaborations, but most found that the draft materials generally, and the elaborations in particular, were quite easy to understand.

Most of the teachers saw the draft elaborations as quite effective in indicating the depth and breadth of learning required in the core learning outcomes. A majority of the teachers indicated high or very high ratings for the workability of the draft elaborations and the extent to which they identify the critical aspects of the core learning outcomes. Some claimed advantages in having the elaborations included within the syllabus.

The concern most often raised by teachers related to the order in which topics are arranged. Other concerns related to assistance needed for planning, assessment and reporting.

We conclude that:

In their current form, the draft curriculum materials provide a sound, workable basis for planning, teaching and learning contexts. At this stage, the elaborations are providing a vehicle for understanding the new syllabus. We conclude that further development of the draft materials should focus on modifying the elaborations, re-examining the level placement of content, and addressing the various specific reservations of the representatives of school authorities about the response of the draft materials to issues identified in the external review.

## 7. Effectiveness – Assessment of Students’ Performance and Progress

### Focus Question 6

How well have the syllabus-in-development schools been able to assess the performance and progress of all students using the draft curriculum materials?

### 7.1 Interviews with trial and development teachers

No interview question directly addressed this focus question, recognising that implementation of the current versions of the draft materials could not have progressed to any great extent by the time of data collection. Nonetheless, assessment issues did arise in other parts of the interview, especially in questions 1, 4, 8 and 10. Sufficient comments arose to indicate that assessment remained an area of concern for some of the trial and development teachers. (Assessment was mentioned by eight of the interviewees.)

A few teachers mentioned assessment as a concern in a general way, for instance:

- *I think they are doing well but I have a small concern over how the reporting and assessment side is going.*
- *People are still not happy with the assessment and reporting sections.*
- *The only concern I have is with assessment and reporting, but it is getting closer to resolution.*

Two requested specific guidance for teachers on assessment:

- *The project is going well but we need to be sure that we can get definite guidance on assessment and reporting. We think that as much time should be spent on assessment and reporting as on the elaborations.*
- *We would like a definite statement on what would be acceptable as catering for the outcomes as far as assessment and reporting are concerned.*

One concern was that teachers would try, or be required, to assess using all of the elaborations:

- *It has come a long way but we are worried that it will be difficult if it is mandatory to cover everything listed in the outcomes and elaborations in the assessment and reporting processes.*
- *I am concerned with so many elaborations that it will cause teachers to use assessment of elaborations to guide their teaching rather than teaching being a follow-up activity to the teaching.*

One school had made considerable progress with assessment and reporting:

- *We have developed a set of criteria for assessment in year 8. We have been developing assessment tools according to our criteria and the outcomes. We have developed student profiles and a reporting procedure for Year 8.*

The nature of some of these concerns indicates misapprehension on the part of some teachers about the purpose of core learning outcomes and elaborations. These misunderstandings may need to be carefully addressed in workshops associated with the expected extended trial phase as well as in the initial in-service materials.

## **7.2 Summary and Conclusions**

Interview questions did not directly address assessment and reporting, but sufficient comments arose to indicate that assessment was an area of concern for some of the trial and development teachers. The nature of some of these concerns indicates misapprehension on the part of some teachers about the purpose of core learning outcomes and elaborations. These misunderstandings may need to be carefully addressed in workshops associated with the expected extended trial phase, as well as in the initial in-service materials.

We conclude that:

It was too early in the project to examine in any depth the ability of schools to apply the draft materials to assessment and reporting. Nevertheless, assessment was an area of concern for some of the trial and development teachers. Some of the concerns indicated misunderstandings about the place of outcomes and elaborations in assessment and reporting. The nature and purpose of core learning outcomes and elaborations need to be addressed in association with the extended trial phase of the project and in the initial in-service materials.

## 8. Effectiveness – Implications for Draft Materials

### Focus Question 7

In light of the above, what improvements may be made to the draft curriculum materials?

### 8.1 Interviews with trial and development teachers

Interview item 9b asked for suggestions to improve the draft elaborations.

#### 8.1.1 Question 9b: What suggestions do you have for improving the draft elaborations?

The majority of teachers either had no suggestions for improvement or said that their suggestions made directly to the project team had been incorporated into the elaborations.

- *None.*
- *We think this has been addressed well at the recent Conference.*
- *None. These guys are pretty on the ball.*
- *Same as for CLOs. We are basically happy but there are a few minor adjustments that we think will be improved in the next version.*

Two teachers offered specific suggestions for improvements.

- *The elaborations are fine. Just make them more visible so you can work with them.*
- *In some instances it needs further clarification perhaps with an example of what the elaboration really means. Some of the wording is difficult to show what it really, specifically means.*

A few teachers emphasised the effectiveness of group discussions involving teachers and Project team members in improving the materials.

- *More of what was done at the Conferences. I like the feedback on our input.*
- *Continued sessions where teachers sit down and go through them. Team now needs to have another look at the overall picture.*

One teacher criticised the elaborations.

- *Whenever we diagnose certain levels we find things missing.*

### 8.2 Discussion

Generally, the interview responses suggest that the development process was providing the trial-and-development teachers with good opportunities to make suggestions for improvement of the materials directly to the project team. Few suggestions for change were made in the interviews except for comments that the order of content needs to match student capabilities more closely at each level.

### 8.3 Summary and Conclusions

The majority of teachers either had no suggestions for improvement or said that their suggestions made directly to the project team had been incorporated into the elaborations. Clearly, the project team have listened to the ideas and suggestions of participating teachers. Many commented that the cluster conferences in Term Three have helped clarify and improve the draft curriculum.

We conclude that:

The trial and development process has been successful in providing teachers with avenues for meaningful participation in the continuous improvement of the draft curriculum materials.



## 9. Efficiency – Electronic Provision of Materials

### Focus Question 8

To what extent has the emphasis on the electronic provision of materials made the job of planning and implementation easier or harder for teachers?

### 9.1 Interviews with trial and development teachers

One interview item dealt specifically with the provision of the curriculum materials in CD-ROM format, requesting suggestions for improvement.

#### 9.1.1 Question 9c: What suggestions do you have for improving the CD?

Although this question invited suggestions, most of the teachers responded with opinions about the CD. Many were not familiar with the CD or had not been able to use it on their computers. Most of those who had used it were pleased with its current form. Few had specific suggestions for improvement other than bringing it up to date with syllabus changes.

A few teachers were pleased with the CD as it was.

- *The planning Wizard is brilliant! It will encourage teachers to write individual programs.*
- *The concept is great. The bit that I have used has been very simple to use, but it would be interesting to see if it will be easy to use by teachers not so technologically aware as other teachers. The bonus is the aid to school programming.*
- *I am quite happy with the CD especially the way you can cut and paste.*

Five teachers referred to the CD being out of date:

- *Needs updating.*
- *I don't use the CD. I was using it last year, but now it is not up to date. It is good and easy to use. Everything is there. I have used it in presentations using the cut and paste facility.*
- *The CD has not had any development this year. I am impressed that this is the first KLA to produce the syllabus on CD and this will save the school a lot of time.*

Two teachers found the assessment section hard to use.

- *The CD is very good but the assessment part is hard. It will need a lot of work to make it user friendly. A lot of people in teaching though are still not computer literate enough to be able to use it well. I still find it hard to do.*
- *The assessment part is too hard to deal with and I have avoided it so far.*

Three teachers had specific suggestions for improvement.

- *We would like to have one each or at least one between two.*
- *Keep the Elaborations on it!*
- *What we need is student-reporting software that allows us to type in a kid's name and generate a comprehensive report.*

Seven of the teachers had not used the CD or could not get it to work:

- *Haven't seen this.*
- *I haven't really used this yet.*
- *I remember looking at the CD last year and being very excited about it but we haven't come to the point of using it yet.*
- *We are still trying to get ours to work.*

## 9.2 Survey

Three survey items pertain to the provision of curriculum materials in CD-ROM format:

- Item 20: How do you rate the CD in terms of making the draft curriculum accessible to you as a teacher?
- Item 21: How do you rate the CD in terms of ease of use?
- Item 22: How do you rate the potential of the planning software in the CD in assisting you with planning school and classroom mathematics programs?

Results are shown in Display 8.

**Display 8: Survey Items 20–22 (CD)**

Rating	Item 20	Item 21	Item 22
Missing	20	20	19
Very low	1	0	2
Low	1	1	1
Moderate	2	4	0
High	4	4	5
Very high	5	4	6
Totals	33	33	33

A high frequency of missing responses occurred on these three items: 20 for items 20 and 21, and 19 for item 22. This apparently reflects a lack of familiarity with the CD, borne out by the fact that 14 teachers wrote comments beside item 20 such as:

- *Have not seen CD so can't comment.*
- *Have not used sufficiently to comment.*
- *Not familiar with this.*

Display 8 indicates that among those teachers who were familiar with the CD most rated it as:

- High or very high in terms of making the draft curriculum accessible to teachers
- Moderate, high or very high in terms of ease of use
- High or very high in terms of the potential of the planning software to assist with planning.

We conclude from these results that if the CD can be made easier to use for teachers, it has high potential for making the curriculum accessible to teachers and providing assistance with planning processes.

## 9.3 Summary and Conclusions

Many were not familiar with the CD or had not been able to use it on their computers. Some teachers did not use it for valid reasons and this needs to be noted. Conclusions about the value of the software for the present purpose must be tempered with the clear recognition that many teachers did not access the CD for various reasons.

Most of those who had used the CD were pleased with its current form. Most rated it highly as a way of making the draft curriculum accessible to teachers. Most found it easy to use and valued its potential to assist teachers with planning. Few had specific suggestions for improvement other than bringing it up to date with syllabus changes.

We conclude that:

Provided the CD can be made easier for teachers to use, it has high potential for making the curriculum accessible and providing assistance with planning processes. Its value, however, is contingent upon the ability of teachers to use software of this kind, their access to suitable computers and their readiness to apply computer-based processes to school and classroom planning.

## 10. Efficiency – Implications for Draft Materials

Focus Question 9

What changes could be made to the materials to make them easier to work with?

### 10.1 Discussion

The results of previous sections indicate the great potential of software that allows teachers to navigate easily through the syllabus, access links to appropriate learning–teaching resources and assists with planning. Notwithstanding the value of such software, however, the interview results would indicate that teachers place a high value on face-to-face interaction with support personnel and with their colleagues from other schools. Another point that emerges is that many teachers were not yet in a position to take advantage of computer-based curriculum materials through lack of access to suitable computers, time pressure or lack of facility with either computers or software of the types involved.

### 10.2 Summary and Conclusions

We conclude that:

The provision of materials in an electronic format promises significant advantages in making the curriculum materials easier to work with, but cannot substitute totally for person-to-person interaction involving colleagues or support personnel. School authorities may need to consider ways to provide direct support to teachers from this point on.

## 11. Concluding Comments

The trial and development process has been successful in providing a sound basis for the expected extended trial phase of the Years 1 to 10 Mathematics curriculum development project. Through a cyclic process of draft – structured feedback – redraft, a well-accepted syllabus has been developed.

The provision of syllabus and associated materials in electronic format promises significant benefits over print format, and this is recognised by many of the trial and development teachers, but not all teachers were able to take full advantage of electronic technology. Even some of those who had no difficulty accessing the CD-ROM appeared to be more appreciative of the interaction provided by school visits from the project team and by cluster conferences involving other teachers.

Taking the evaluation results as a whole, and considering the purposes of the trial and development phase, we consider that the project will be in a sound position to proceed to the extended trial phase in 2002.

## **Appendixes**

**Appendix 1 Interview — Trial and Development Teachers**

**Appendix 2 Survey Questionnaire**

**Appendix 3 External Review**

**Appendix 4 Results of the External Review**

**Appendix 5 Survey Results**

**Appendix 6 Trial and Development Schools**

## **Appendix 1: Interview – Trial and Development Teachers**

# YEARS 1 TO 10 MATHEMATICS CURRICULUM DEVELOPMENT PROJECT

## TRIAL AND DEVELOPMENT PHASE

EXTERNAL EVALUATION TERM THREE, 2001

This interview is for teachers taking part in the trial and development phase of the Queensland School Curriculum Council curriculum development project for Years 1 to 10 Mathematics.

The goal of the interview is to elicit the opinions and experiences of teachers within the relevant contexts of the syllabus-in-development schools. The results of this interview will be specific to your school and you as a teacher. We will report our findings in terms of the way teachers in a range of school situations have responded to the draft 1 to 10 Mathematics materials.

<b>Part 1: Messages</b>
1. What messages do you have for the Project Team, the Evaluator or the Queensland School Curriculum Council?
<b>Part 2: Your teaching context</b>
2. What are the salient characteristics of your teaching situation?
3. School size and type
4. The Year levels you teach
5. Characteristics of your students
6. Your training in mathematics and mathematics education
7. Your teaching experience
8. Your school's viewpoint on teaching mathematics and its place in the curriculum
<b>Part 3: The Syllabus-in-development process</b>
9. The project team has set up various communication channels with the trial and development schools. How readily are you able to communicate your views to the project team?
10. How well is the project progressing overall?
<b>Part 4: The draft materials (syllabus and other materials)</b>
11. How compatible are the present materials with your school's viewpoint on the teaching of mathematics and its place in the curriculum?
12. How adaptable is the draft curriculum to the needs and abilities of the students in your school?
13. What have you done so far in regard to the draft materials?
14. What can you say about your experiences with the draft materials so far?
a. What do you like about the draft materials?
b. What concerns or doubts do you have?
c. What has been easy to understand?
d. What has been difficult to understand?
<b>Part 5: General issues</b>
15. What suggestions do you have for improving:
a. The draft core learning outcomes?
b. The draft elaborations?
c. The CD?
16. Do you wish to make any other comments?

## Appendix 2: Survey Questionnaire



Thank you for completing the survey. Please return it to the principal for mailing back.

Our address is EdData, PO Box 1199, Sunnybank Hills, Qld 4109.

Please use the space below for any other comments.

## The Years 1 to 10 Mathematics Curriculum Project

### External Evaluation

### Survey of Trial and Development Teachers



This survey is for teachers taking part in the QSCC Years 1 to 10 Mathematics project. The results will form a significant part of the independent external evaluation of this curriculum. The findings will appear in a formal report to the QSCC later this year. Please complete your survey as soon as possible and return it to the principal who will send it on to us. Alternatively, you may send it to the address on the back of this booklet.

- Every teacher's response is important.
  - You may, if you wish, add comments to explain your response to each question.
  - Space is provided on the back page of the booklet for other comments.
  - Your responses are anonymous.
  - A copy of the results will be sent to your school.
  - Start with the background questions below:
1. What Year levels do you teach this year?  1-3;  4-7;  8-10
  2. Were you a trial teacher last year?  Yes;  No
  3. School sector:  Catholic;  Independent;  State
  4. Your Maths Education:  Degree major;  Some tertiary;  Secondary
  5. Years of teaching experience:  Less than 2;  2-5;  More than 5
  6. Your familiarity with the draft 1-10 Mathematics materials?  
 Very Low;  Low;  Moderate;  High;  Very High

**Response Code: VL=Very Low; L=Low; M=Moderate; H=High; VH=Very High**

<b>Questions</b> (Please tick one column beside each question)	<b>VL</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>VH</b>	<b>Comment</b>
7. To what extent do the present materials reflect current views in education about mathematics curriculum for schools?						
8. How do you rate the effectiveness of the draft <b>core learning outcomes</b> as information for teachers?						
9. How do you rate the effectiveness of the draft <b>elaborations</b> in indicating the depth and breadth of learning required in the core learning outcomes?						
10. How do you rate the workability of the draft <b>elaborations</b> in your context with your students?						
11. To what extent do the <b>elaborations</b> identify the critical aspects that underlie the core learning outcomes?						
12. How do you rate the effectiveness of the <b>strands</b> as a way of organising the syllabus?						
13. How do you rate the appropriateness of the topics in the <b>Number</b> strand?						
14. How do you rate the appropriateness of the topics in the <b>Patterns and Algebra</b> strand?						
15. How do you rate the appropriateness of the topics in the <b>Measurement</b> strand?						
16. How do you rate the appropriateness of the topics in the <b>Chance and Data</b> strand?						
17. How do you rate the appropriateness of the topics in the <b>Spatial Concepts and Visualisation</b> strand?						
18. To what extent does <b>Working Mathematically</b> show through in the draft elaborations?						
19. How do you rate the potential of the present syllabus-in-development materials for meeting the needs of the students that you teach?						
20. How do you rate the CD in terms of making the draft curriculum accessible to you as a teacher?						
21. How do you rate the CD in terms of ease of use?						
22. How do you rate the potential of the planning software in the CD in assisting you with planning school and classroom mathematics programs?						
23. To what extent will the developing curriculum be an improvement from the present?						
24. To what extent will improvements in the curriculum justify the effort, time and resources that are going into this development project?						

## **Appendix 3: External Review**

This appendix reproduces the first two pages of the instrument used to collect responses in Stage Three of the process. The other pages are similar in format to the second page shown, containing the other 11 issues as shown in Display 1.

# **External Evaluation of the Years 1 to 10 Mathematics Curriculum Development Project**

## **External Review Component**

**July 2001**

This document forms the basis of one component of the external evaluation of the Queensland School Curriculum Council project on Years 1 to 10 Mathematics.

The document contains a series of response sheets. Each sheet relates to one of a set of 11 issues that have been identified as impacting currently on mathematics curriculum in schools.

Each response sheet deals with a single issue. For each issue there is a statement describing how the Years 1 to 10 Mathematics Curriculum (in its current stage of development) responds to the issue.

We invite you to review each of these statements and indicate whether the response is appropriate to your organisation.

The EdData evaluation team will seek to meet with you to elicit and record your comments for each issue.

## **Issue 1: The forms and roles of assessment and reporting**

**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

The draft syllabus section on assessment and reporting contains advice well beyond earlier syllabuses. There is a link between that and the Council's Assessment and Reporting Draft Policy And Guidelines.

**Is this response appropriate for your organisation?**

- Yes
- Yes with reservations
- No

**Please comment:**

## **Appendix 4: Results of the External Review**

## Issue 1: The forms and roles of assessment and reporting

### How the draft in development Years 1 to 10 Mathematics responds to this issue:

The draft syllabus section on assessment and reporting contains advice well beyond earlier syllabuses. There is a link between that and the Council's Assessment and Reporting Draft Policy And Guidelines.

### Is this response appropriate for your organisation?

Yes	A
Yes with reservations	E, C
No	

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

### Please comment:

#### Education Queensland:

- Assessment and reporting have been flagged as major issues by teachers.
- The development of the reporting framework is a function of the employing authority. This aspect should not be an issue for the syllabus project team.
- Practical ideas on assessment which are efficient and effective should be included in the support materials.

#### Association of Independent Schools of Queensland Inc.:

- No comment

#### Queensland Catholic Education Commission:

- We are grappling with the whole reporting issue as a curriculum team which includes consultants who are working with teachers on other published syllabuses. The Council's guidelines are a guide to this process.

## Issue 2: Catering for diversity in the teaching of mathematics

### How the draft in development Years 1 to 10 Mathematics responds to this issue:

The draft syllabus makes specific comment on this issue. The way the core learning outcomes are written allows for a wide range of teaching-learning processes to cater for the needs of different students or different groups. The outcomes approach is a socially just approach. Foundation levels will address the more specific needs of some students.

### Is this response appropriate for your organisation?

Yes	C
Yes with reservations	E, A
No	

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

**Education Queensland:**

- Teaching strategies and learning styles are not clearly identified and addressed in the current draft of the syllabus. This issue is particularly relevant for Early Childhood, Middle Years and Senior Schooling education.
- The dichotomies of beliefs and approaches including:
  - closed vs opened activities,
  - passive vs active engagement,
  - procedural vs meaningful tasks,
  - didactic vs constructive strategies,could be flagged in the rationale and elaborated in the support materials.

**Association of Independent Schools of Queensland Inc.:**

- There has been a concern throughout the early viewings of the Maths Syllabus that the outcomes and elaborations could be taught as isolated areas of learning and not part of mathematical understandings in real life contexts.
- If this was the case, then the syllabus would not necessarily encourage diversity in the reading of mathematics.

**Queensland Catholic Education Commission:**

- Having been in on many discussions about the drafting of outcomes this issue is taken into account as much as possible.

**Issue 3: The relative emphasis between mental computation and standard written forms**

**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

There is emphasis in the earlier levels on the growth of mental computations in preference to written computations. Specific mention of mental computation is made in the core learning outcomes at level 2. It is left open elsewhere for the selection of preferred working options.

**Is this response appropriate for your organisation?**

Yes	A
Yes with reservations	C
No	E

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

**Education Queensland:**

- The present outcome statements do not show an emphasis on mental computation in the early years. It is highlighted in the elaborations but they are not mandated and are not to be included in the syllabus.
- The current process of collaborative review of the outcome statements may address this issue.

**Association of Independent Schools of Queensland Inc.:**

- The idea of developing mental computation in young learners suggests a focus on thinking about maths and hopefully the development of understanding. This is needed to change attitudes to mathematics and to allow learners to be able to develop a range of strategies for mathematical modelling and problem solving.

**Queensland Catholic Education Commission:**

- I have been working to make this a more obvious focus. I'm not sure which draft you are referring to. I know that as of 17 August it is looking better than it was prior to this.



## Issue 4: The role of language in mathematics

### How the draft in development Years 1 to 10 Mathematics responds to this issue:

The role of language in mathematics is seen as absolutely critical. The words 'everyday language' appear often in core learning outcomes at early levels, and the use of everyday language is encouraged. The support materials encourage teachers to let students work collaboratively and cooperatively, which should support development of deeper understanding. Attempts are made throughout the syllabus and materials to be consistent in the use of terminology.

In core learning outcomes, frequent use is made of words such as explain, describe and identify. Even though the use of language is consistent within the syllabus, the ways the core learning outcomes are worded can allow teachers to explain using students' language and accept students' own language use. There is flexibility in what teachers can accept from students. On the other hand, as progress is made to the higher levels, then the language of mathematics becomes more conventional and formalised, and expectations for correct use of that language are explicit.

### Is this response appropriate for your organisation?

Yes	E, A, C
Yes with reservations	
No	

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

### Please comment:

#### Education Queensland:

- No comment

#### Association of Independent Schools of Queensland Inc.:

- Allowing students to experiment with ways of describing mathematical ideas seems a logical follow-on from developing a focus on mental computation. The notion of 'deeper understanding' is critical if students are to go on to cope effectively with the requirements of language that is 'conventional and formalised'.

#### Queensland Catholic Education Commission:

- The focus on language throughout will help the incorporating of working mathematically into the other strands.

**Issue 5: Mathematics curriculum for the middle years of schooling**  
**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

The syllabus is very developmentally set out. This will give teachers an understanding of how mathematics education is developed. It will, like the Year Two Diagnostic Net, help teachers to understand how mathematics concepts develop and how children learn. The core learning outcomes clearly show the developmental nature of mathematics. This applies to all strands and across all levels.

**Is this response appropriate for your organisation?**

Yes	C
Yes with reservations	A
No	E

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

**Education Queensland:**

- The statement indicates the developmental nature of mathematical concepts and skills but fails to mention the development of the learner.
- The age appropriateness of the content must be considered.
- Statements regarding the needs of students in Early Childhood, Middle Years and Senior Schooling should be included in the introduction to the syllabus.

**Association of Independent Schools of Queensland Inc.:**

- Learning outcomes while showing the developmental nature of mathematics are only successful if the maths is placed in contexts where application, communication and understanding can be demonstrated.

**Queensland Catholic Education Commission:**

- No comment

**Issue 6: Teachers' understanding of mathematics education**

**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

The detail provided via the core learning outcomes, core content and elaborations will equip non-mathematics trained teachers to plan and teach effectively, assist them to monitor learning and identify common difficulties that students may experience.

**Is this response appropriate for your organisation?**

Yes	C
Yes with reservations	A
No	E

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

**Education Queensland:**

- This is not the role of the syllabus. Teacher training institutions and employing authorities should be responsible for this issue.
- Appropriate teacher training, professional development and a clear implementation plan are required.
- It is possible that the elaborations may be interpreted as the content and indicators of the outcome. These elaborations may be viewed by non-mathematics trained teachers as 'the path' rather than the 'guide posts'. These teachers will see the parts rather than the whole.
- Further development of the core content may assist in this area.

**Association of Independent Schools of Queensland Inc.:**

- Outcomes and elaborations if taken as isolated steps could be 'taught' and checked off without learning transfer and understanding taking place.

**Queensland Catholic Education Commission:**

- This is a real strength of the current format of the draft syllabus which is well liked by teachers as well.

**Issue 7: The nature of numeracy and its place in the mathematics key learning area**

**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

Numeracy is seen as one of four cross-curricular priorities. The Rationale in the draft syllabus has a brief statement on numeracy (page 6). This statement is in line with the Queensland School Curriculum Council position paper on numeracy. The position taken is that mathematics provides the tools for numeracy. Numeracy demands that students can apply the tools in a range of contexts.

**Is this response appropriate for your organisation?**

Yes	E, C
Yes with reservations	A
No	

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

**Education Queensland:**

- No comment

**Association of Independent Schools of Queensland Inc.:**

- Mathematics is more than providing the tools for numeracy. It is developing the understanding of where, how, why to use those tools – is this numeracy?

**Queensland Catholic Education Commission:**

- This is a difficult topic as it is seen by many teachers as being in the domain of mathematics and as such if this syllabus makes a big 'deal' of numeracy – more so than other Queensland School Curriculum Council syllabuses this view will be reinforced. The working mathematically aspect which is written into the outcomes will be, in my opinion, where the numeracy lies.

## Issue 8: The place of realistic mathematics

**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

The syllabus rationale deals with this issue in some respects. The core learning outcomes, core content and elaborations talk about using the mathematics in realistic situations. This will be further emphasised in the syllabus support materials. The draft syllabus gives enough scope for teachers to use methods based on realistic problems and situations.

**Is this response appropriate for your organisation?**

Yes	A, C
Yes with reservations	E
No	

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

### **Education Queensland:**

- This is not the role of the syllabus.
- Application of the mathematical knowledge and skills to a realistic context is the responsibility of the teacher. To assist teachers, practical applications and the identification of realistic and appropriate contexts needs to be a priority for the syllabus support materials.
- Mapping of the sequence of outcomes across all KLAs and the application of mathematical knowledge and skills within the other KLAs should be considered.

### **Association of Independent Schools of Queensland Inc.:**

- Surely this is at the heart of Mathematics teaching and learning. What point to such a practical subject if not to teach it within real and meaningful contexts?
- May still be a problem with teaching concepts in isolation than putting it in same 'supposed realistic situation'.
- Which comes first – surely the recognition of a real situation or problem, consideration for how to solve this problem and the concepts, tools and thinking needed to solve it.

### **Queensland Catholic Education Commission:**

- The best place for this will be in the support materials yet to be developed.

## Issue 9: The role of learning technologies

**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

The draft syllabus is explicit about encouraging the use of computers and calculators etc. in relevant places through core content and the elaborations. Equity and access considerations have prevented specific mention in core learning outcomes of the use of learning technology and other technologies, especially electronics-based technologies. By design, teaching–learning processes have been left to the school and teacher. There will, however, be suggestions and sample modules in the support materials related to the effective use of technology, especially electronics-based technologies.

**Is this response appropriate for your organisation?**

Yes	E, A, C
Yes with reservations	

No	
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Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

<p><b>Education Queensland:</b></p> <ul style="list-style-type: none"> <li>No comment</li> </ul> <p><b>Association of Independent Schools of Queensland Inc.:</b></p> <ul style="list-style-type: none"> <li>Essential to incorporate technology in a range of forms.</li> <li>Need to get away from computer software that is 'drill and kill' and into real life and virtual situations.</li> </ul> <p><b>Queensland Catholic Education Commission:</b></p> <ul style="list-style-type: none"> <li>This is crucial for a syllabus that will become effective from 2004.</li> </ul>
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**Issue 10: Practicality for teachers: the ease with which teachers can understand and learn to use the new curriculum**

**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

It is a mental leap for teachers to plan on the basis of what students learn rather than on what is to be taught. Core content and elaborations are provided to assist teachers to unpack the core learning outcomes. Support materials will provide sample teaching-learning activities, planning proformas and assessment advice.

**Is this response appropriate for your organisation?**

Yes	C
Yes with reservations	E, A
No	

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

<p><b>Education Queensland:</b></p> <ul style="list-style-type: none"> <li>The current collaborative review process, which incorporates the understandings of the teachers within the trial schools, should assist in addressing this issue. However, in the initial review by EdData, the implications for teacher planning was the question that elicited the greatest spread in teacher responses (Interview question 12).</li> <li>The support materials referred to are unseen at present, so it is not possible to assess the practicality for teachers.</li> <li>This issue has implications for teacher training, professional development and the syllabus implementation plan (similar to Issue 6).</li> </ul> <p><b>Association of Independent Schools of Queensland Inc.:</b></p> <ul style="list-style-type: none"> <li>For teachers in classrooms it can look very systematic and easy to 'check off' eg teach these elaborations – this covers an outcome, teach the next set – there's another outcome.</li> <li>There is a fear that while this may simplify process for teachers does it bring out understanding, transfer of learning, the interrelatedness of different outcomes for learners.</li> </ul> <p><b>Queensland Catholic Education Commission:</b></p> <ul style="list-style-type: none"> <li>Teachers I have shown this to have made particular unsolicited comments about the usefulness of this syllabus (from what they have seen so far). This has been from secondary and primary teachers.</li> </ul>
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**Issue 11: Continuity with current programs (1–10, 11–12)**

**How the draft in development Years 1 to 10 Mathematics responds to this issue:**

It is possible for schools and teachers to use the old 1–10 syllabus in planning for core learning outcomes at school or classroom level. Outcomes should be compatible with processes (inputs) and content in the old 1–10 syllabus. The new syllabus puts focus more on what students will learn and have learned. Explicit links have been made between the Syllabus Advisory Committees at the BSSSS and the Council. Every effort has been, and will continue to be, made in relation to the articulation between the Years 1–10 and 11–12 Mathematics Syllabuses. This will help to ensure that students have clear pathways towards their choices of further study in Years 11–12.

**Is this response appropriate for your organisation?**

Yes	C
Yes with reservations	E, A
No	

Code: A=Association of Independent Schools of Queensland Inc.; C=Queensland Catholic Education Commission; E=Education Queensland

**Please comment:**

**Education Queensland:**

No comment

**Association of Independent Schools of Queensland Inc.:**

- It seems that the old 1–10 syllabus and support materials, particularly in Sourcebook form, have not been adapted by Secondary Schools. A situation of the bringing down of the BSSSS syllabus for Yr 12–Yr 8, and the bringing up of 1–10 syllabus from Yr 1 to Yr 7 has left some sort of gap at the 7–8 interface.
- A syllabus that is continuous from P or 1–10 is necessary. It must be accepted, adapted and used by both Prim & Sec groups.
- If teachers continue to use the old syllabus will there be a change in the current situation in relation to Year 7 and 8?

**Queensland Catholic Education Commission:**

- I know this has been a focus of the team and the subject of much discussion. It is getting much closer.

## Appendix 5: Survey Results

## Responses to Background Items

1. What Year levels do you teach this year?

Missing	2
1–3	9
4–7	7
8–10	14
4–10	1
<u>Total</u>	33

Comment: Similar numbers of primary and secondary teachers.

2. Were you a trial teacher last year?

Missing	0
Yes	14
No	19
<u>Total</u>	33

Comment: Indicates that returns were received from all schools that were sent surveys. Mean of 1.4 non-trial teachers responding from each school.

3. School sector:

Missing	0
Catholic	10
Independent	7
State	16
<u>Total</u>	33

Comment: All three sectors participated in survey.

4. Your Maths Education:

Missing	1
Degree major	9
Some tertiary	21
Secondary	2
<u>Total</u>	33

Comment: Few teachers without tertiary study in mathematics. High correlation between this variable and Primary/Secondary as shown below. Not used for comparisons.

	Degree major	Some tertiary	Secondary	Total
Primary only	1	12	2	15
Secondary only	8	6	0	14
Total	9	18	2	29

[Missing and multiple = 4]



5. Years of teaching experience:

Missing	0
Less than 2	1
2–5	2
<u>More than 5</u>	<u>30</u>
Total	33

Comment: Most respondents were experienced teachers. Avoid breakdowns on this variable.

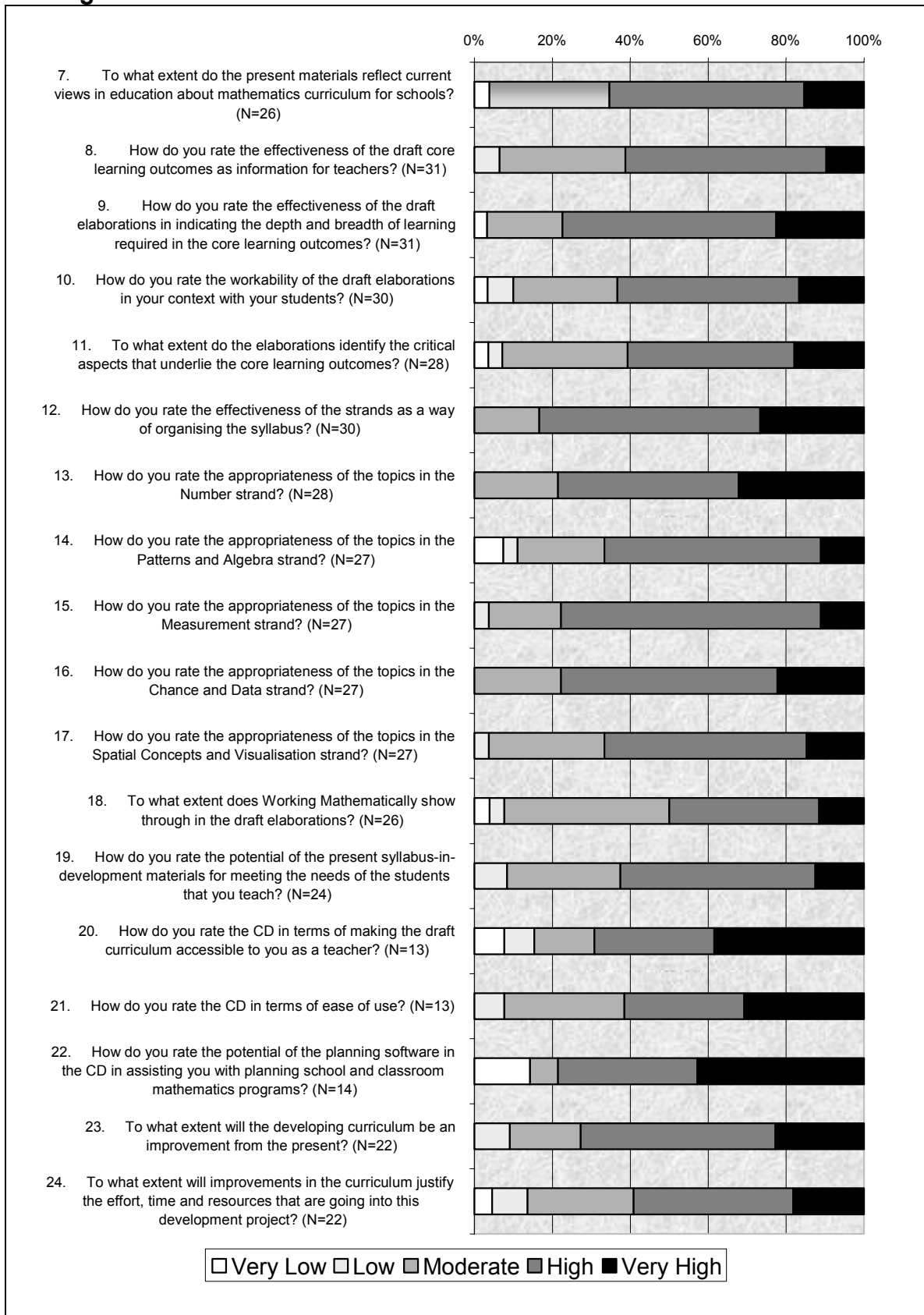
6. Your familiarity with the draft 1–10 Mathematics materials:

Missing	1
Very Low	1
Low	4
Moderate	12
High	12
<u>Very High</u>	<u>3</u>
Total	33

Comment: Most indicate moderate or high levels of familiarity. Indicates the use of two levels of familiarity for breakdowns (Moderate or below; High or above). Crosstabulation with Item 2 shows only slight tendency for trial teachers to indicate higher levels of familiarity:

	Familiarity with draft materials:						
Trial teacher?	Very low	Low	Moderate	High	Very high	Missing	Total
Yes		1	7	6			14
No	1	3	5	6	3	1	19
Total	1	4	12	12	3	1	33

## Ratings for items 7 to 24



Note: Missing responses not included

## Comparisons for Background Variables

For the purposes of analysing group differences, means were calculated for each of items 7 to 24 by assigning scores of 1 to 5 for the rating levels Very Low to Very High.

Two new variables were defined by averaging the means of sets of items in the survey as shown in the table below:

Variable	Mean of items
Appropriateness	7, 13 to 17
Workability	8 to 12, 19

Comparisons were made for these two variables as well as for items 18, 23 to 24. Items 20 to 22 were not analysed because of too few valid responses (13, 13, 14). Analysis of variance procedures were used to examine the differences. The results are provided in graphic form in the following pages.

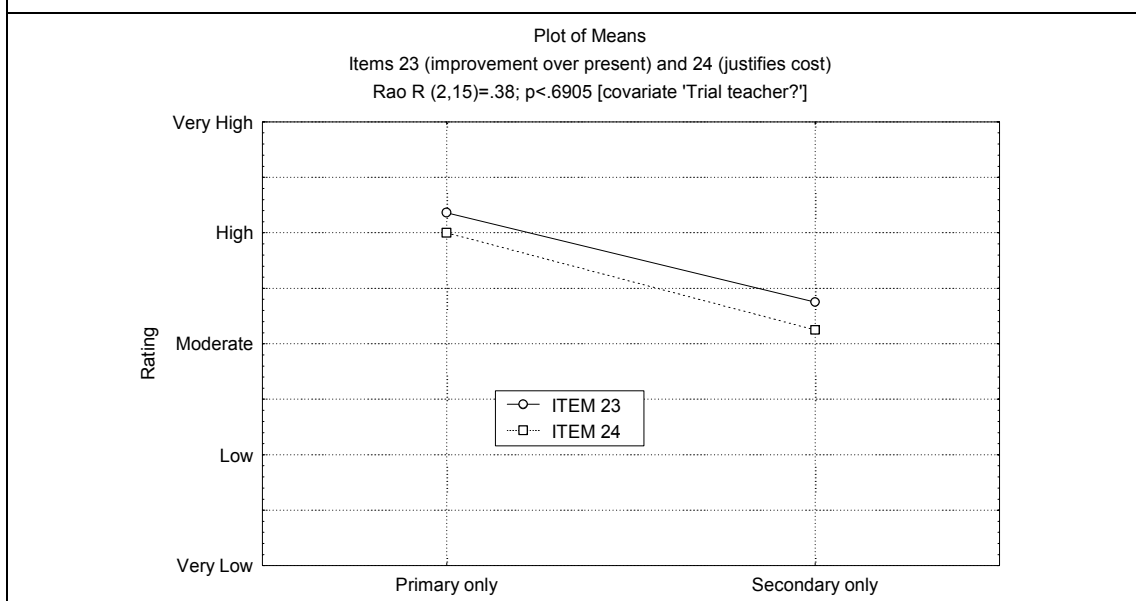
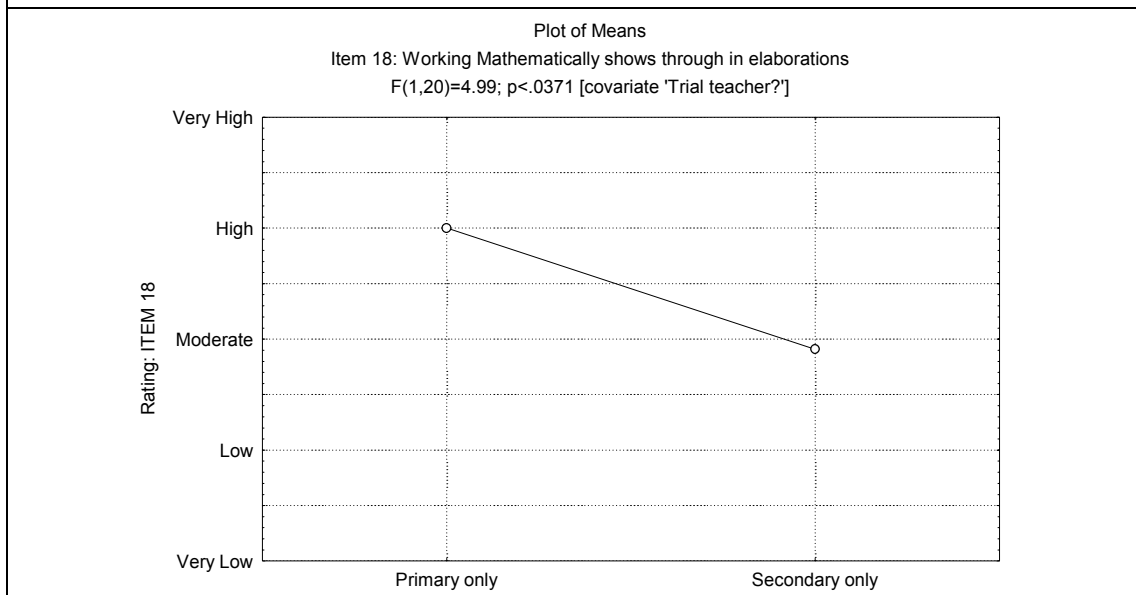
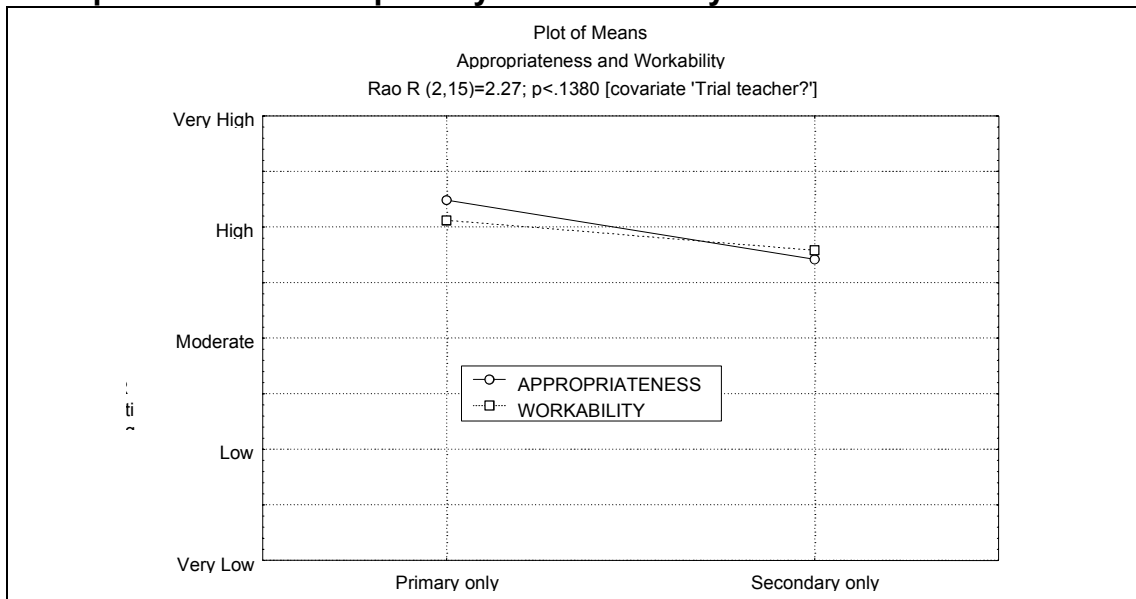
The following independent variables were defined for the analysis:

Independent variable	Definition	Comment
Primary/secondary	For item 1, 'What Year levels do you teach this year?' code responses 1–3 and 4–7 as 'Primary only' and 8–10 as 'Secondary only'. Allow multiple responses for primary but omit responses that include both primary and secondary years.	Only one multiple response excluded
Trial teacher?	Item 2, 'Were you a trial teacher last year?' responses 'yes' or 'no'.	
Sector	Item 3 'School sector:' responses 'Catholic', 'Independent' or 'State'.	
Maths education	Item 4 'Your Maths Education' responses 'Degree major', 'Some tertiary' and 'Secondary'.	Only two responses for 'Secondary' and levels found to correlate highly with Primary/secondary so no comparisons made on this variable
Years of teaching experience	Item 5 'Years of teaching experience:' responses 'Less than 2', '2–5' and 'More than 5'.	Only three responses for 'Less than 2' or '2–5' so no comparisons made on this variable.
Familiarity with draft materials	Item 6 'Your familiarity with the draft 1–10 Mathematics materials?' responses 'Very Low', 'Low', 'Moderate', 'High' and 'Very High' combined to form two levels, 'Very Low to Moderate' and 'High to Very High'.	Two levels of familiarity used in comparisons.

### Notes:

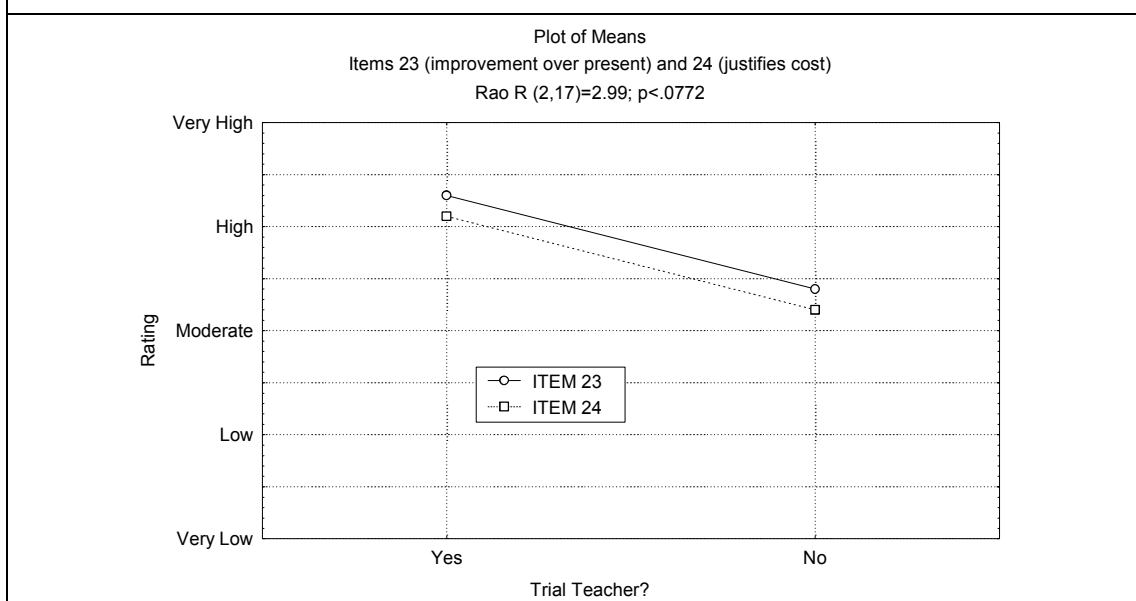
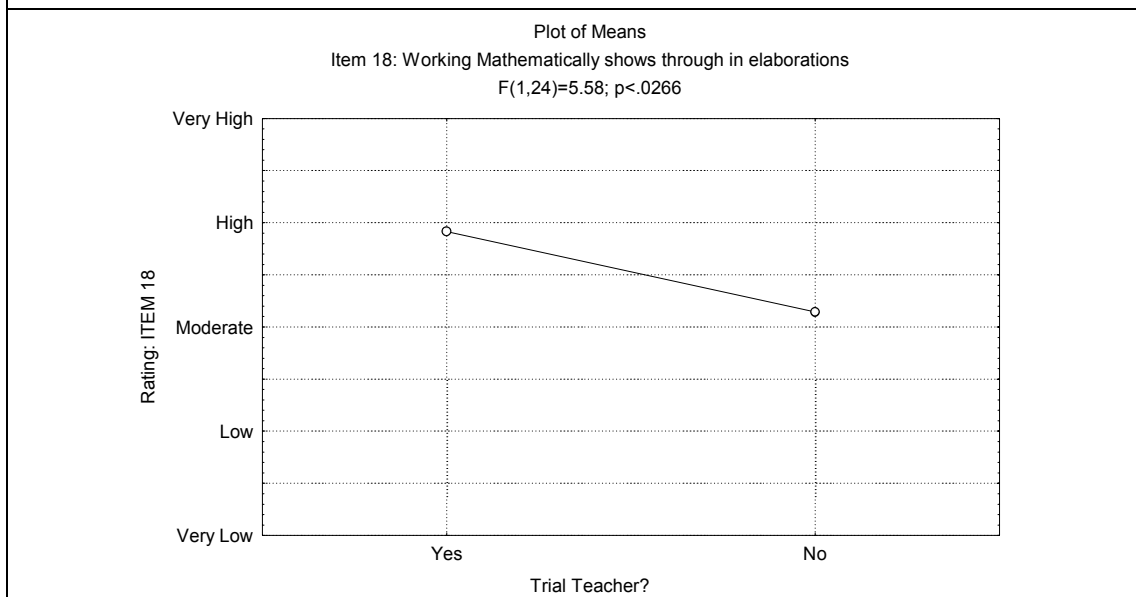
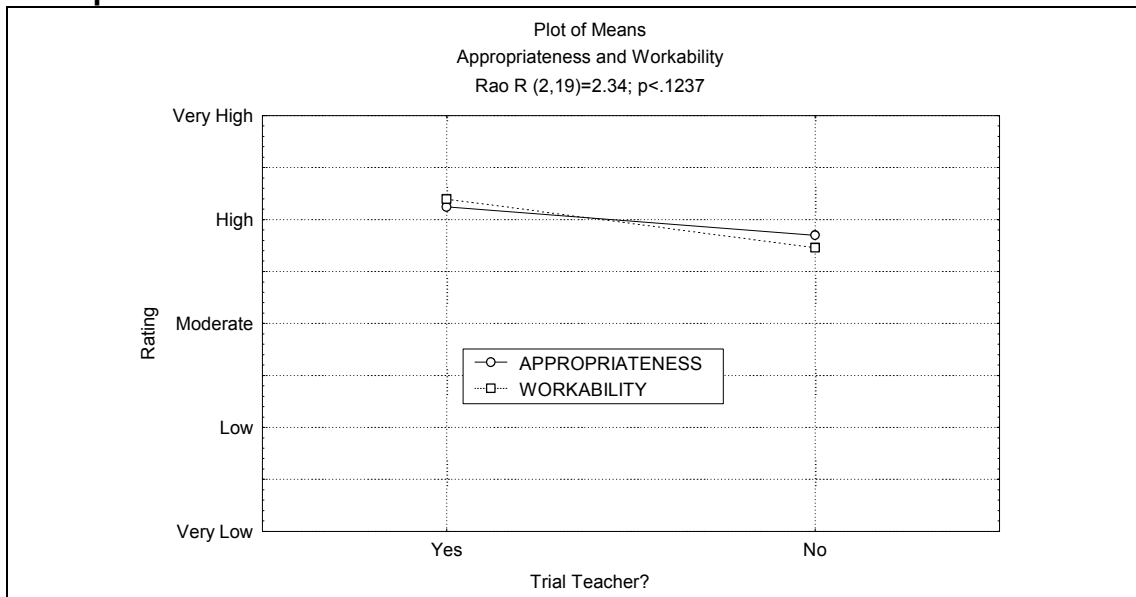
1. Considering the purposes of this study, we believe that 0.1 is a reasonable alpha-level for significance testing.
2. Because the variable 'Trial teacher?' is clearly a source of variance within all of the other groups, it was used as a covariate for the analysis in the other groups.
3. Where apparent differences are shown as non-significant, the variance between the groups is not large enough to outweigh the variance within the groups.

## Comparisons between primary and secondary teachers



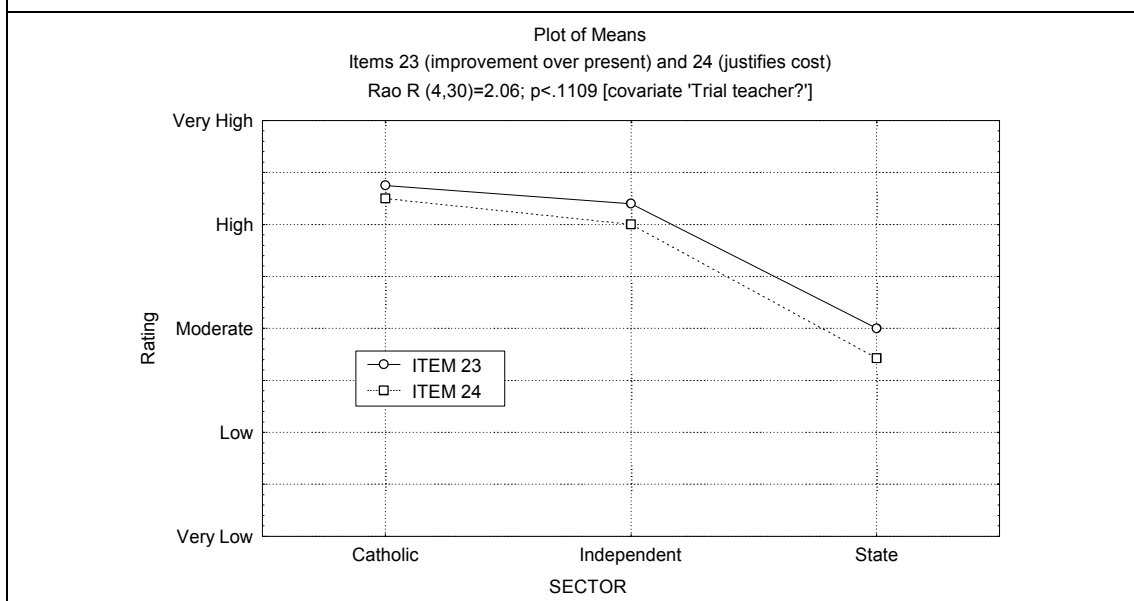
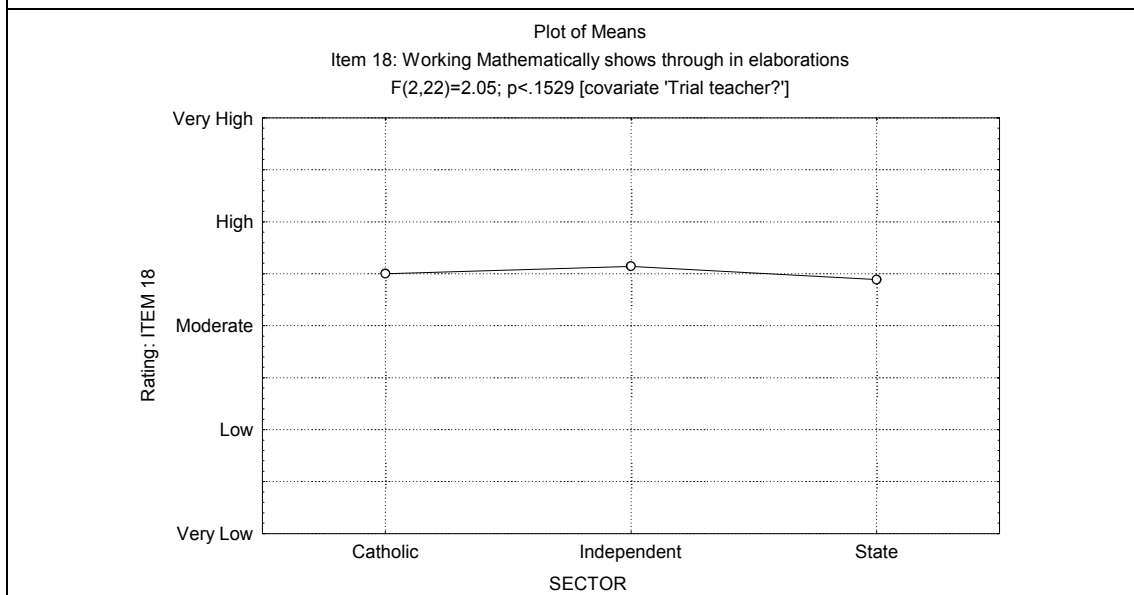
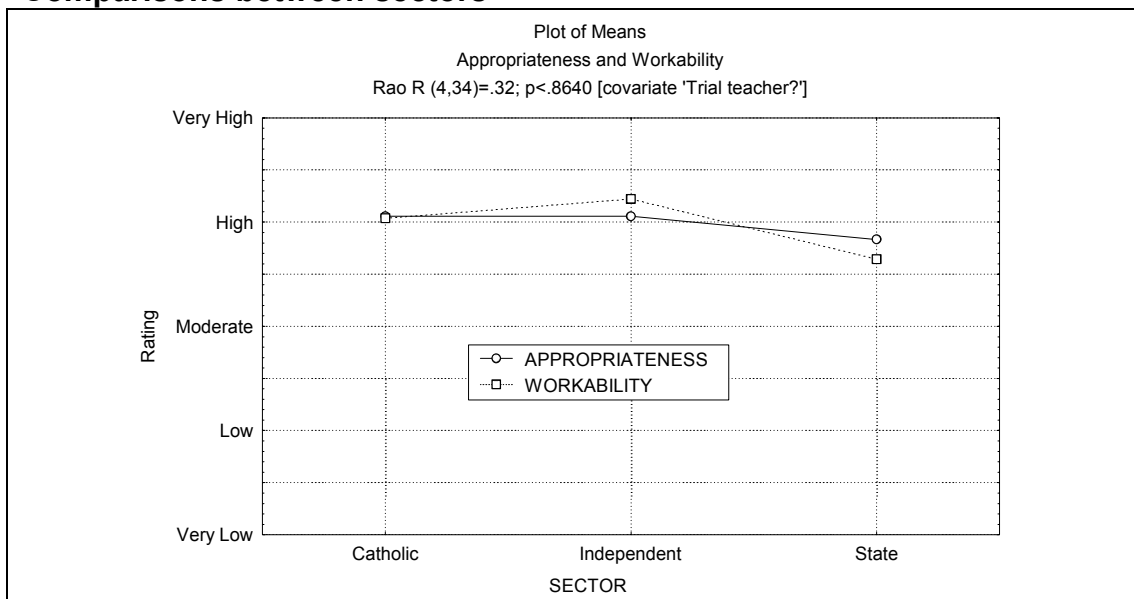
Comment: Primary teachers' ratings higher than secondary teachers on Item 18. Other differences are not significant.

## Comparisons between trial teachers and non-trial teachers



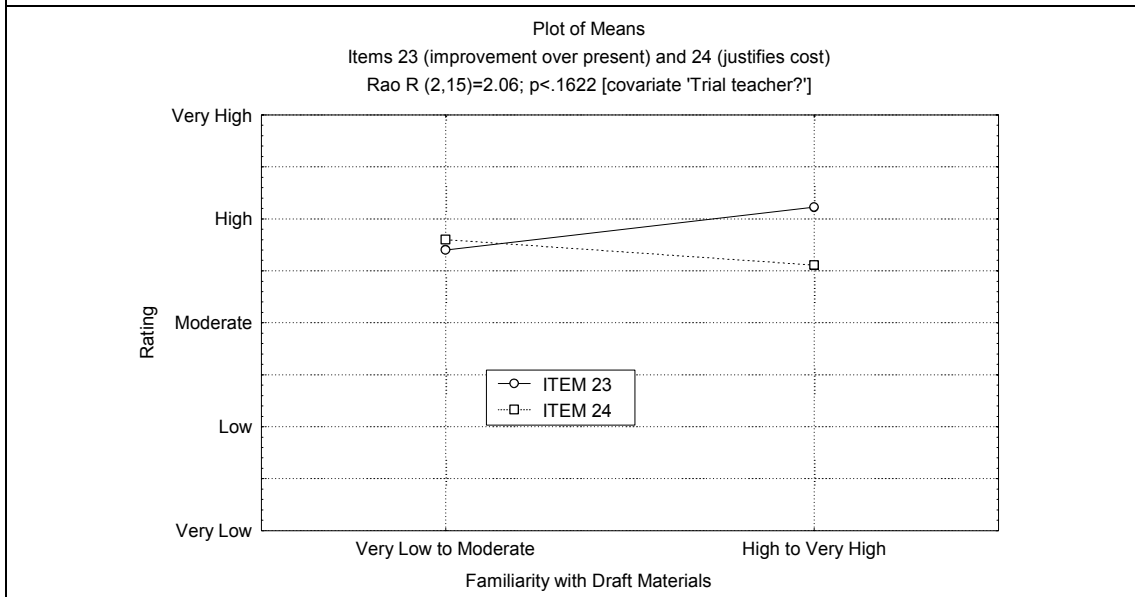
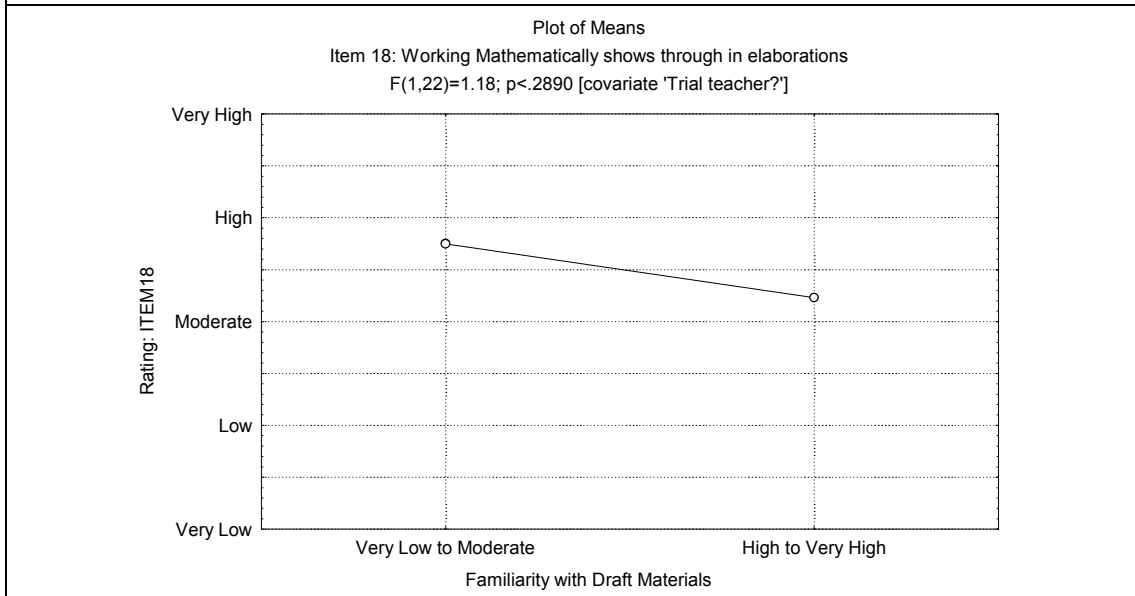
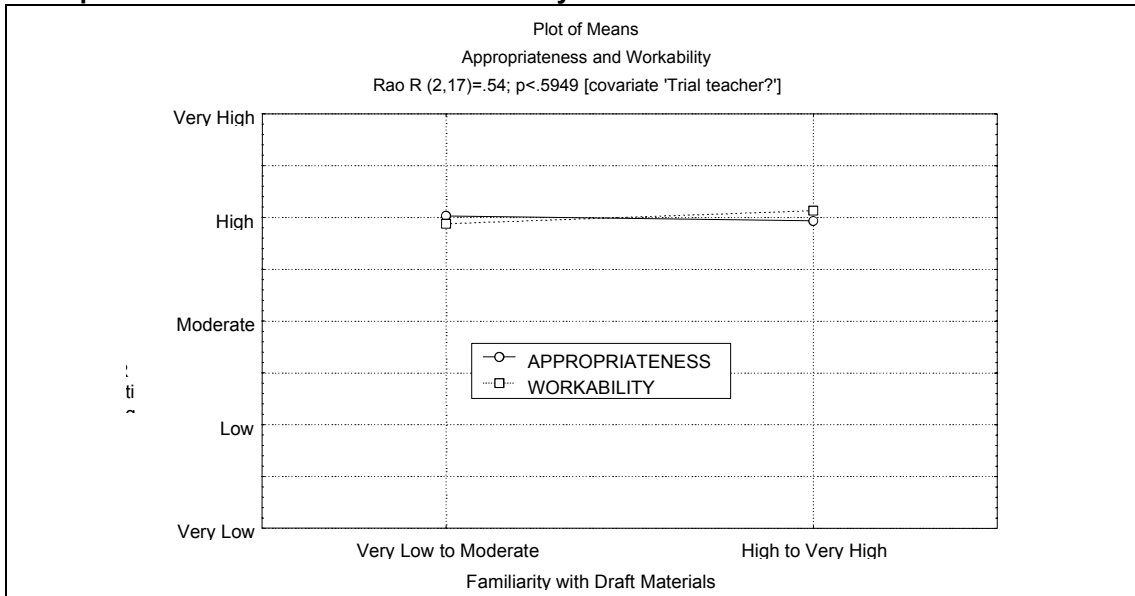
Comment: Trial teachers' ratings higher on Items 18 and 23-24. No significant difference for appropriateness or workability.

## Comparisons between sectors



Comment: No significant differences according to sector.

**Comparisons based on indicated familiarity with the draft materials**



Comment: No significant differences according to familiarity.

## Appendix 6: Trial and Development Schools

School	Location
Bouldercombe State School	Central Queensland
Bribie Island State School	Bribie Island
Bundaberg State High	Bundaberg
Emmaus College	Rockhampton
Glenmore State School	Rockhampton
Our Lady of the Sacred Heart School	Springsure
Redeemer Primary Lutheran School	Biloela
Sheldon College	Redland Shire
South Burnett Catholic College	Kingaroy
Southern Cross Catholic College	Redcliffe
St John's Primary Lutheran School	Bundaberg
St Luke's Anglican College	Bundaberg
The Gap State High School	Brisbane
Woorabinda State School <sup>*</sup>	Woorabinda
Tieri State School	Tieri
Wynnum West State School <sup>*</sup>	Brisbane

<sup>\*</sup> Not included in evaluation



### ***Evaluation and Review Report Series***

1997 Year 6 Test: Report on School Survey

Evaluation of 1998 Queensland Years 3 and 5 Testing Program: Results of Principal and Teacher Surveys

Evaluation of 1998 Queensland Years 3 and 5 Testing Program: Results of Principal and Teacher Surveys (Inclusivity Issues)

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Evaluation of 1999 Queensland Years 3, 5 and 7 Testing Program: Final Report

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Review of Queensland Literacy and Numeracy Testing Programs, 1995 to 1999 (Issues Paper)

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Evaluation of the Years 1 to 10 The Arts Curriculum Development Project: Report 1

Evaluation of the Years 1 to 10 The Arts Curriculum Development Project: Report 2

Evaluation of the Years 1 to 10 The Arts Curriculum Development Project: Report 3

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Evaluation of the Years 1 to 10 Technology Curriculum Development Project: Report 2

Evaluation of the Years 1 to 10 Technology Curriculum Development Project: Report 3

Evaluation of the Years 1 to 10 English Curriculum Development Project: Report 1

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Evaluation of the Years 1 to 10 Mathematics Curriculum Development Project: Report 1

Evaluation of the Years 1 to 10 Mathematics Curriculum Development Project: Report 2

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