



Stage 3
Interim research and evaluation report 6

**Professional Learning Facilitators:
Confidence, self-efficacy, activities as at end
of Term 3, 2006**

A research report for the Australian Academy of
Science

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Introduction

The implementation of any new initiative in primary schools requires the strong support of the principal and strong leadership from leader teachers or coordinators in that learning area. Research with professional learning programs at secondary and primary schools (Goodrum, Hackling & Trotter, 2003; Goodrum, Hackling & Sheffield, 2003; Hackling & Prain, 2005; Lewthwaite, 2006) indicate that the provision of professional learning workshops and exemplary curriculum resources, opportunities for collegial interaction and reflection on practice, support of the principal and strong leadership by leader teachers/coordinators are required for successful implementations. The growth and effectiveness of teacher leaders depends on their personal attributes (e.g., motivation, self-efficacy), microsystem factors such as collegial and external supports, mesosystem factors such as the priority placed on the subject by their school and the schools openness to change, exosystem factors such as parent and community expectations, and macrosystem factors such as state and national curriculum agendas (Bronfenbrenner, 1989; Lewthwaite, 2006).

Research into the professional learning and growth of professional learning facilitators who will provide workshops for teachers of *Primary Connections* will provide insights into their activities and how they can be supported to be effective in their roles. Little research has been reported in the literature on the professional growth of professional learning facilitators and therefore this research has the potential to make an original contribution to the literature in addition to informing further developments of the *Primary Connections* program.

Data gathered from the professional learning facilitators trained at the three-day January 2006 workshop (Hackling, 2006a) indicated that the facilitators were generally confident with their science teaching practice, had some experience of facilitating professional learning, and at the end of the workshop had made gains in confidence and self-efficacy as a facilitator. The data gathered at the end of the Term 1 workshop (Hackling, 2006b) indicated that the gains made in confidence and self-efficacy as a facilitator had been maintained despite the fact that many had not yet had opportunity to conduct workshops. Palmer's (2006) research with pre-service primary teachers of science and Hackling and Prain's (2005) research with in-service teachers indicates that maintenance of gains in self-efficacy developed through workshops is enhanced when they have the opportunity to put into practise the skills learned in workshops. It would therefore be expected that the professional learning facilitators in this project would experience further growth in confidence and self-efficacy as a facilitator after having experienced success with conducting workshops in Terms 2 and 3.

Purpose

The purpose of this study was to elicit from professional learning facilitators (PLFs), at the end of term 3 of 2006, information about: their confidence and self-efficacy as facilitators; their professional learning activities; factors supporting or inhibiting their effectiveness; how the professional learning resources can be improved and what further support they need in their role.

Method

A questionnaire based survey method was adopted to gather information from the PLFs. Questionnaires are effective and economical for gathering information from large numbers of participants and the data gathered are relatively easy to code and analyse.

The questionnaire included a mix of open response questions and closed objective items. A copy of the questionnaire is attached as an Appendix.

Sample

The sample of PLFs (n=60) that attended the end of Term 3 workshops completed the survey. This group was reasonably representative of the population of PLFs (n=89) that were trained at the January 2006 workshop.

Results

This section of the report presents demographic information about the participants, information about their professional roles, self-efficacy and confidence as professional learning facilitators, and the professional learning activities they had engaged with. Data are also presented about the PLFs' use of the supplied professional learning resources, and factors enabling or facilitating the effectiveness as a PLF.

Demographic data

Table 1 summarises the number of PLFs attending workshops and completing questionnaires.

Table 1: Numbers of respondents for all surveys by role in 2006.

Role in 2006	Number of respondents				
	Initial workshop	End workshop	End term 1	End term 3	Completed all surveys
PC trial teacher in a school	16	16	14	9	6
Teacher in a school, new to PC	31	30	24	25	24
District/central office adviser	29	28	26	20	17
Professional association adviser	7	7	5	4	3
Science organization adviser	6	4	3	2	2
Totals	89	85	72	60	52

The number of PLFs attending workshops at the end of Term 1 and at the end of Term 3 was less than attended the January workshop. Only 52 of the initial 89 PLFs completed all questionnaires. The data reported in this research report relate to these 52 PLFs. The proportion of classroom teacher PLFs in the sample of 52 increased from 53% to 58% with the greatest reduction of participation in non-school based PLFs being in the science organisation advisor category (see Table 2). Given that all categories of PLFs are represented in the sample, the sample of 52 is therefore reasonably representative of the population of 89 PLFs who attended the January workshop.

Table 2: Numbers of respondents for all PLF surveys in 2006 by whether or not they are teaching in classrooms.

Role	Number of respondents (%)							
	Initial workshop		End term 1		End term 3		All surveys	
Classroom teachers	47	53%	38	53%	34	57%	30	58%
Others	42	47%	34	47%	26	43%	22	42%
Totals	89		72		60		52	

The reduction in numbers attending the workshops may be due to difficulties of PLFs being able to clear their diary of commitments or gain teacher release to attend the workshops, or this may indicate a reduced commitment to the role.

Key finding 1: The number of PLFs attending the January, end of Term 1 and end of Term 3 workshops progressively decreased from 89, to 72 to 60.

Self-efficacy and confidence as a professional learning facilitator

PLFs completed 5-point Likert scale items relating to their self-efficacy with aspects of the PLF role and relating to their confidence with facilitating various *Primary Connections* workshops. These results are based only on facilitators who completed the self-efficacy and confidence as a facilitator rating scales for all surveys. PLFs initial self-efficacy ratings before the January workshop, and their ratings after each workshop are reported in Table 3. Scores were reversed for negatively stated items and data are reported as mean ratings for each item on the scale and as a mean total self-efficacy score for the eight-item scale.

Mean ratings for seven of the eight items were very positive (>4) with only Item 7 which relates to the early childhood years being rated less than 4 (3.8). Mean ratings on seven of the eight items increased from the end of Term 1 to the end of Term 3 and the mean total self-efficacy scale score increased from 33.6 to 34.7. The increase in self-efficacy was anticipated as opportunities for experience success in conducting workshops would enhance self-efficacy beliefs. As noted on earlier surveys the teachers PLFs (33.9) had lower self-efficacy than the other PLFs (35.8) and this could be attributed to the non-teacher PLF's greater prior experience of facilitation as reported in Hackling (2006).

Table 3: Mean self-efficacy ratings of PLFs as professional learning facilitators for all surveys in 2006. (n=40)

Aspect of self-efficacy as professional facilitator	Mean score for aspect (/5)											
	Whole group (n=40)				Class teachers (n=23)				Others (n=17)			
	Initial	End Jan W/S	End term 1	End term 3	Initial	End Jan W/S	End term 1	End term 3	Initial	End Jan W/S	End term 1	End term 3
1 I am effective in eliciting teachers' prior knowledge and beliefs and adjusting the professional learning workshop to meet the needs of the teachers	3.9	4.1	4.2	4.4	3.5	4.0	4.1	4.3	4.4	4.4	4.4	4.5
2 My science content knowledge enables me to answer teachers' science questions effectively	3.8	4.1	4.2	4.3	3.6	4.0	4.1	4.1	4.0	4.3	4.3	4.4
3 My knowledge of effective science teaching practices enables me to answer teachers' science pedagogy questions effectively	4.0	4.2	4.3	4.4	3.7	4.0	4.1	4.3	4.4	4.5	4.5	4.6
4 I am quite comfortable with having my professional learning workshops evaluated	4.2	4.3	4.4	4.6	3.8	4.0	4.2	4.4	4.6	4.7	4.6	4.8
5 I am able to pose engaging tasks for teachers to work on in small groups in my workshops	4.0	4.3	4.4	4.4	3.7	4.1	4.2	4.3	4.4	4.6	4.5	4.6
6 My deep understanding of the culture of primary schooling enables me to give valuable advice to teachers on matters of primary science pedagogy	3.9	4.1	4.3	4.4	3.7	4.0	4.2	4.4	4.1	4.3	4.4	4.4
7 My deep understanding of the culture of early childhood education enables me to give valuable advice to ECE teachers about science pedagogy	3.4	3.6	3.7	3.8	3.2	3.6	3.7	3.7	3.5	3.6	3.8	4.0
8 My deep understanding of literacy teaching practice enables me to give valuable advice on integrating literacy education into science education	3.9	4.1	4.2	4.4	4.0	4.2	4.3	4.4	3.7	4.0	4.1	4.4
Mean total self efficacy scale score (/40)	30.88	32.93	33.6	34.7	29.2	31.9	32.8	33.9	33.1	34.4	34.6	35.8

Note. 5= SA = strongly agree, 4=A = agree, 3=UN = undecided, 2=D = disagree, 1=SD = strongly disagree. Scores are reversed for negatively stated items so that the most positive response =5 and the least positive response = 1

Key finding 2: Self-efficacy scores increased from end Term 1 to end Term 3 and were very positive. The mean total scale score for teacher PLFs was lower than for other PLFs.

The frequency of teacher total self-efficacy scale scores at various levels of self-efficacy are reported in Table 4. These data are based on only the 40 participants who completed this scale on all questionnaires.

Table 4: Frequency of self-efficacy scores for all surveys in 2006. (n=40)

Self efficacy score (/40)	Frequency											
	Whole group (n=40)				Class teachers (n=23)				Others (n=17)			
	Initial	End Jan W/S	End term 1	End term 3	Initial	End Jan W/S	End term 1	End term 3	Initial	End Jan W/S	End term 1	End term 3
15 - 20	2	0	0	0	2	0	0	0	0	0	0	0
21 – 25	0	0	1	0	0	0	1	0	0	0	0	0
26 – 30	17	12	9	5	12	9	6	5	5	3	3	0
31 - 35	13	16	18	16	7	9	11	9	6	7	7	7
36-40	8	12	12	19	2	5	5	9	6	7	7	10
Mean total self efficacy scale score (/40)	30.9	32.9	33.6	34.7	29.2	31.9	32.8	33.9	33.1	34.4	34.6	35.8
S.D.	4.85	4.05	3.96	3.58	4.67	4.12	3.93	3.30	4.24	3.60	3.32	2.56

Note. PLF self-efficacy score = sum of eight self-efficacy scores for each teacher, (/40), with the most positive response given the value of 5 and the least positive the value of 1

When the PLFs completed the initial questionnaire prior to the January workshop, 19 of 40 PLFs had a total scale score of less than 31. This was reduced to 12/40 by the end of the January workshop, to 10/40 by the end of Term 1 and reduced again to 5/40 at the end of Term 3. The remaining five PLFs with modest self-efficacy were all teacher PLFs. It is likely that the number of PLFs with modest self-efficacy has been reduced significantly through the resources and workshops provided by the *Primary Connections* program and through opportunities to practise as a facilitator.

Key finding 3: Of the PLFs that completed self-efficacy scales on all questionnaires, the number of PLFs with modest self-efficacy scores (<31) has been reduced from 19/40 at the commencement of their training to 5/40 at the end of Term 3.

The PLFs also rated their confidence with facilitating professional learning workshops related to various aspects of teaching primary science and literacy. The PLFs rated their confidence on a 5-point scale (1 = no confidence to 5 = very confident). These data are reported in Table 5.

Table 5: A comparison between teacher PLFs and other PLFs in the survey of mean ratings of confidence with facilitating professional learning workshops on the following aspects of primary science and literacy teaching for all surveys in 2006 (n=40)

Aspect of facilitating	Mean score for aspect (/5)											
	Whole group (n=40)				Class teachers (n=23)				Others (n=17)			
	Initial	End Jan W/S	End term 1	End term 3	Initial	End Jan W/S	End term 1	End term 3	Initial	End Jan W/S	End term 1	End term 3
An introduction to <i>Primary Connections</i>	3.6	4.4	4.4	4.6	3.5	4.2	4.0	4.4	3.6	4.5	4.8	4.7
Coordinating the science program in a primary school	4.0	4.3	4.1	4.5	3.8	4.1	4.0	4.4	4.3	4.5	4.2	4.5
Assessment of learning in primary science	3.9	4.1	4.1	4.4	3.7	4.0	3.7	4.3	4.1	4.2	4.6	4.4
Conducting investigations in primary science	4.2	4.4	4.3	4.5	3.9	4.1	3.9	4.3	4.5	4.7	4.8	4.8
Cooperative learning strategies	4.1	4.3	4.4	4.5	3.9	4.1	4.2	4.4	4.3	4.6	4.6	4.6
Developing literacies needed for learning science	3.8	4.2	4.2	4.4	3.8	4.1	4.0	4.5	3.9	4.4	4.4	4.4
Using an inquiry model to plan primary science units of work	4.0	4.3	4.3	4.5	3.7	4.1	4.0	4.3	4.4	4.6	4.6	4.7
Mean total confidence score (/35)	27.48	29.88	29.65	31.25	26.3	28.7	27.9	30.6	29.0	31.5	32.0	32.2
SD for total scores	4.78	4.00	3.96	3.07	4.58	3.97	3.65	3.33	4.76	3.51	3.12	2.48

NC = No confidence = 1 LC= Limited confidence =2, OK = 3 C = confident= 4, VC = Very confident = 5

At the end of Term 3 the mean confidence scores for facilitating workshops related to all aspects of *Primary Connections* were very high (>4.3/5). Further growth in mean total confidence scale scores occurred between the end of Term 1 (29.65/35) and the end of Term 3 (31.25/35). The mean total scale score for non-teacher PLFs (32.2) was higher than that of teacher PLFs (30.6). The strongest growth in confidence was for teacher PLFs for facilitation of workshops on assessment (3.7 to 4.3) and for conducting investigations (3.9 to 4.3). It is likely that confidence has increased due to the training and resources provided by the *Primary Connections* program and opportunity to experience success as a PLF.

Key finding 4: Mean total confidence scale scores increased from the end of Term 1 to the end of Term 3. Mean item scores were all very positive (>4.3). Non-teacher PLFs had higher confidence than teacher PLFs.

Professional learning activities

The PLFs indicated how frequently they had engaged in various professional learning activities during Terms 2 and 3. These data are reported in Tables 6-8. Activities other than presenting papers or workshops at conferences, districts or schools are reported in Tables 6 and 7.

Table 6: Number of times that PLFs have engaged in various professional learning activities during Terms 2 and 3 (n=60)

Professional learning activity	Number of respondents			
	never	1 – 3 times	4 – 10 times	Many times
Answering questions about <i>Primary Connections</i>	4	9	12	34
Showed the <i>Primary Connections</i> curriculum units to a colleague	2	13	23	22
Sharing your experiences with <i>Primary Connections</i> with colleagues.	7	14	16	21
Teaching <i>Primary Connections</i>	25	11	2	19
Engaged in journaling, analysing and reflecting on your own science teaching practice	27	7	8	15
Observing a trial teacher/colleague teaching <i>Primary Connections</i>	36	14	3	5
Invited a colleague to observe you teaching <i>Primary Connections</i>	41	11	4	1
Visiting a <i>Primary Connections</i> trial school to see how they have organised the program within their school	44	13	2	0
Engaged in gaining the Principal's support and planning for the implementation of <i>Primary Connections</i> at your school	24	18	8	4
Made a short presentation outlining the features of <i>Primary Connections</i> to school staff	22	29	8	1
Presented an information session for a group of school principals	47	10	3	0
Presented an information session for a group of district/sector curriculum area leaders/policy officers/consultants	39	18	2	1
Shown video clips from the <i>Questioning Minds</i> DVD	17	28	4	4

The least frequent activities were presenting an information session for a group of school principals, visiting a *Primary Connections* school to see how they have organised their program, and inviting a colleague to observe you teaching *Primary Connections*. The most frequent activities were answering questions about *Primary Connections*, showing *Primary*

Connections resources to a colleague, and sharing experiences of *Primary Connections* with a colleague.

Key finding 5: More professional learning activities were conducted by PLFs in Terms 2 and 3 compared with Term 1. There were differences in the types and frequencies of activities conducted by teacher PLFs and other PLFs.

Table 7 shows the per cent of teacher PLFs and other PLFs who engaged in various frequencies of professional learning activities. These data reveal that the two groups participate in different types of professional learning activity, corroborating the findings of the end of Term 1 survey. For example, 46% of non-teacher PLFs visited a *Primary Connections* trial school whereas only 9% of teacher PLFs were able to do this.

Table 7: Per cent of PLFs that have engaged in professional learning activities during Terms 2 and 3, for classroom teachers and others. (n=60)

Professional learning activity	Per cent of respondents					
	Classroom teachers (n=34)			Others (n=26)		
	Never	1-10	lots	never	1-10	lots
Answering questions about <i>Primary Connections</i>	3	36	61	12	35	54
Showed the <i>Primary Connections</i> curriculum units to a colleague	3	56	41	4	65	31
Sharing your experiences with <i>Primary Connections</i> with colleagues.	9	41	50	17	67	17
Teaching <i>Primary Connections</i>	21	26	53	69	15	15
Engaged in journaling, analysing and reflecting on your own science teaching practice	29	32	38	74	17	9
Observing a trial teacher/colleague teaching <i>Primary Connections</i>	53	32	15	69	23	0
Invited a colleague to observe you teaching <i>Primary Connections</i>	62	35	3	83	13	0
Visiting a <i>Primary Connections</i> trial school to see how they have organised the program within their school	91	9	0	52	48	0
Engaged in gaining the Principal's support and planning for the implementation of <i>Primary Connections</i> at your school	29	65	6	65	26	9
Made a short presentation outlining the features of <i>Primary Connections</i> to school staff	38	62	0	35	62	4
Presented an information session for a group of school principals	76	24	0	81	19	0
Presented an information session for a group of district/sector curriculum area leaders/policy officers/consultants	68	32	0	62	35	4
Shown video clips from the <i>Questioning Minds</i> DVD	24	74	3	35	54	12

It was pleasing to note that 79% of the teacher PLFs taught *Primary Connections* during Terms 2 and 3 which was a large increase on the 53% who taught *Primary Connections* in

Term 1 (Hackling 2006b). Use of the Questioning Minds DVD increased for both groups of PLFs in Terms 2 and 3 compared with Term 1; 72% all PLFs used the DVD in Terms 2 and 3. The increased frequency of various activities is likely to be related to the greater opportunity in two terms (Terms 2 and 3) to engage in activities than was possible in Term 1.

The PLFs also reported the number of *Primary Connections* papers, workshops or information sessions they had presented in Terms 2 and 3. The 60 PLFs who completed this questionnaire presented 21 papers or workshops at conferences and 35 workshops or information sessions at schools or district venues.

Table 8: Presentation of papers or workshops at conferences and workshops or information sessions at schools by PLFs in Terms 2 and 3.

Have you presented a workshop or paper at a conference? Yes = 21 If yes, name of conference: 5 state, 14 national, 2 regional
If you have presented an information session or workshop at a school? <u>Location of workshop:</u> (Range of number who attended)
<ul style="list-style-type: none"> • 11 at own school, (3 – 82) • 9 at another school, (1 – 48) • 1 at another venue, (1) • 14 at multiple schools (9 – 26)

Key finding 6: A total of 56 papers, workshops and information sessions were presented in Terms 2 and 3 by the 60 PLFs who completed this questionnaire.

The PLFs also reported the types of workshops they had presented in Terms 2 and 3 and planned to present in Term 4 of 2006. These data are presented in Table 9.

Table 9: PC professional learning workshops facilitated by PLFs in Terms 2 and 3 and planned for Term 4 in 2006.

Workshop	Number of PLFs with this response			
	Terms 2 & 3		Planned for term 4	
	All (n=60)	Teachers/others (n=34/26)	All (n=60)	Teachers/others (n=34/26)
Yes, I have facilitated/plan to facilitate a workshop	40	22/18	16	4/12
Introduction to <i>Primary Connections</i> workshop	38	21/17	12	3/9
Investigating workshop	18	10/8	1	1/0
Literacies of science workshop	15	8/7	1	1/0
Assessment workshop	13	7/6	1	0/1
School Coordinators workshop	9	3/6	1	0/1
Auditing workshop	7	5/2	0	0/0

At the end of Term 1, less than two-fifths of PLFs had presented a workshop (Hackling, 2006b). Forty of the 60 PLFs who answered the end of Term 3 questionnaire had presented workshops, i.e., two-thirds of these PLFs are active. As expected most workshops presented in Terms 2 and 3 or planned for Term 4 are the Introduction to *Primary Connections* workshop. It is most interesting to note the significant number of PLFs who have presented investigating, literacies of science, assessment, school co-ordinators and auditing workshops.

There is no major difference between teachers and those not teaching in the classroom with regards to the types or numbers of workshops they have facilitated in Terms 2 and 3. However, those not in the classroom have more workshops planned for Term 4.

Key finding 7: At the end of Term 3 two-thirds of the PLFs had presented workshops, which represents an increase in activity over Term 1. There was no major difference in the numbers and types of workshops presented by teacher PLFs and other PLFs during Terms 2 and 3.

Factors enabling or inhibiting professional learning activity

PLFs were asked about the factors that enabled or inhibited their effectiveness as a PLF. Enabling factors are reported in Table 10.

Table 10: Facilitators' responses to the question "What factors are enabling you to be effective in your role as a *Primary Connections* professional learning facilitator?" at the end of Term 3. (n=60)

Enabling factors	Number of responses	Per cent of cohort with this response
My position/role, established communication structures	14	23
Time (prepared/ release)	9	15
High interest in resources, they are easy to sell	8	13
Support from principal, admin, district coordinator	6	10
Skill as presenter	6	10
Knowledge of the pedagogy	5	8
Support for own pd/from Canberra/ PD done in Jan	4	7
Links/meeting with other facilitators	3	5
Own science knowledge	3	5
Good resources	2	3
Not facilitating	2	3
Experience as a PC trial teacher	2	3
Total responses	64	
No response	17	28

The main cluster of factors enabling facilitators to be effective in their role is their position with its established communication network, support from their supervisors and time being available for facilitating professional learning. Other frequently mentioned enablers were the high interest in the program and their own knowledge of pedagogy and skill as a facilitator developed through the workshops provided by the Academy of Science.

Factors inhibiting PLFs effectiveness are reported in Table 11.

Table 11: Facilitators' responses to the question "What factors are limiting your effectiveness as a *Primary Connections* professional learning facilitator?" at the end of term 3. (n=60)

Limiting factors	Number of responses	Per cent of cohort with this response
Not facilitating	2	3
Finding time to facilitate, unwilling to leave own class for long	26	43
Schools have trouble finding time (conflicts with other programs, science low priority)	15	25
Low demand for PD from schools	9	15
Schools' knowledge of program	4	7
Not enough facilitators, high demand on student free days	4	7
State issues	4	7
Need copies of PC books	3	5
Support from admin	3	5
Lack of funds for PD	3	5
Lack experience presenting	1	2
Total responses	75	
Number of respondents with no response	5	8

As previously reported at the end of Term 1 (Hackling, 2006b), the main limitations seem to be time, either facilitators finding time or schools finding time to run the workshops. In this survey, a significant limitation is 'low demand for PD' from schools which may be a reflection of conflicting priorities for teacher professional learning

Key finding 8: The main factors enabling PLFs' effectiveness include their position, communications network, support of line managers, time being available for facilitation work, high interest in *Primary Connections*, and having the knowledge and skills required for facilitating *Primary Connections* workshops. The main inhibitors appear to be time for facilitation work and conflicting priorities within schools for making time available for *Primary Connections* workshops.

When asked about their needs for further support with their role as PLFs, 42% of PLFs did not indicate they had further needs for support (see Table 12). Relatively small numbers expressed needs for continuing support from their sector, district and the Academy and time to work with other PLFs in their jurisdiction to adapt the resources to suit the local context. Some PLFs needed further information or training on some aspects of the program.

Table 12: Facilitators' responses at the end of Term 3 to the question: What further support (resources, training etc) do you need for your role as a *Primary Connections* professional learning facilitator? (n=60)

Type of support needed	Number	Per cent of respondents
Ongoing state PD, support from Academy, region and DET	7	12
Time to integrate with state curriculum, to plan with others	6	10
More info on particular areas (assessment, literacy links, ICT, auditing)	6	10
Help on how to present	4	7
None	4	7
Funding for relief and for planning, presentations	3	5
More units	2	3
Total number of responses	40	
No response	25	42

Summary of Key Findings

The key findings from this survey are summarised in Table 13.

Table 13:

Key findings	
1	The number of PLFs attending the January, end of Term 1 and end of Term 3 workshops progressively decreased from 89, to 72 to 60.
2	Self-efficacy scores increased from end Term 1 to end Term 3 and were very positive. The mean total scale score for teacher PLFs was lower than for other PLFs.
3	Of the PLFs that completed self-efficacy scales on all questionnaires, the number of PLFs with modest self-efficacy scores (<31) has been reduced from 19/40 at the commencement of their training to 5/40 at the end of Term 3.
4	Mean total confidence scale scores increased from the end of Term 1 to the end of Term 3. Mean item scores were all very positive (>4.3). Non-teacher PLFs had higher confidence than teacher PLFs.
5	More professional learning activities were conducted by PLFs in Terms 2 and 3 compared with Term 1. There were differences in the types and frequencies of activities conducted by teacher PLFs and other PLFs.
6	A total of 56 papers, workshops and information sessions were presented in Terms 2 and 3 by the 60 PLFs who completed this questionnaire.
7	At the end of Term 3 two-thirds of the PLFs had presented workshops, which represents an increase in activity over Term 1. There was no major difference in the numbers and types of workshops presented by teacher PLFs and other PLFs during Terms 2 and 3.
8	The main factors enabling PLFs' effectiveness include their position, communications network, support of line managers, time being available for facilitation work, high interest in <i>Primary Connections</i> , and having the knowledge and skills required for facilitating <i>Primary Connections</i> workshops. The main inhibitors appear to be time for facilitation work and conflicting priorities within schools for making time available for <i>Primary Connections</i> workshops.

Discussion and Conclusions

The findings of the survey are mostly very positive, however, the declining number of PLFs attending the follow-up workshops is of concern. Numbers declined from 89 at the January 2006 workshop to 60 who attended and completed the survey at the end of Term 3 workshop (KF1). There may have been a few PLFs who attended the workshop but did not complete the survey and therefore were not counted as attending the workshop. There are a number of possible explanations for the decline in numbers. Difficulty with getting away from regular commitments such as teaching may explain why some PLFs were not able to attend workshops, however, there may be some who have lost commitment to the role of PLF as they may lack the knowledge and skills, or confidence and self-efficacy to succeed in the role, or have given other responsibilities a higher priority. Those that did attend the end of Term 3 workshop and completed the survey had high self-efficacy and confidence (KF 2 and KF 4). Of those that attended the Term 3 workshop and all previous workshops, the number with modest self-efficacy had reduced from 19/40 to 5/40, thus a potential impediment to their participation in the role had been removed (KF 3). The provision of professional learning resources, training in the role and other support systems has been very effective in developing a cadre of highly confident and self-efficacious PLFs.

Most of the PLFs have been quite active in their role (KF 5, KF 6 and KF 7). More professional learning activities were conducted in Terms 2 and 3 than in Term 1. Increased activity is likely to be a consequence of increased opportunity, growth in confidence and self-efficacy, and growth in jurisdictional and sectoral networks and co-ordination of activities more effectively linking schools and PLFs, and increased demand for professional learning as awareness of the program increases in schools. Demand for *Primary Connections* professional learning is expected to increase as more schools and districts become aware of the program.

The two groups of PLFs, the classroom based teacher PLFs and the non-classroom based PLFs, differed in a number of respects. Non-teacher PLFs had more experience of facilitation when they commenced the program (Hackling, 2006a) and have maintained higher levels of confidence and self-efficacy as PLFs (KF 2 and KF 4). As expected, there have been some differences in their professional learning activities as a consequence of one group working within a school and others not, however, in terms of conducting workshops there was very little difference in the types and numbers of workshops conducted by the two groups during Terms 2 and 3 (KF 7).

The number of school co-ordinators workshops conducted so far is relatively small and this may be related to the fact that the group of trial teachers and the teachers trained in the two-day Spotlight on *Primary Connections* workshops in Queensland have been effective science co-ordinators at their schools. As the program spreads out from these lighthouse schools there will be an increasing need for trained co-ordinators within new schools adopting *Primary Connections* if the program is to be implemented effectively.

The factors enabling or inhibiting PLFs' effectiveness at the end of Term 3 are similar to those identified in the end of Term 1 survey, however, it was noticeable in this survey that 42% of PLFs did not identify any additional needs for support. The main constraints appear to be local factors such as time for facilitation and for adapting resources to local contexts, support of the line managers, and competing demands on schools' use of time for teacher professional learning (KF 8).

Implications

The professional learning program and resources provided to the PLFs have proved most effective in developing highly confident and self-efficacious facilitators of professional learning, whom, on the whole have been active in their facilitation role. The research findings suggest that the professional learning model is appropriate and should be retained for further cohorts of PLFs.

Further trialling, evaluation and revision of the professional learning resources are required to ensure they meet the needs of PLFs.

There is likely to be a need for an increased number of school co-ordinator workshops to train curriculum leaders in schools who can co-ordinate an effective implementation of *Primary Connections* in their schools.

There is a need for continued advocacy at all levels for a high priority to be given to science teacher professional learning and for adequate local support for PLFs within their jurisdictions, sectors, districts and schools.

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Appendix

**End Term 3 Professional Learning facilitators Questionnaire
Australian Academy of Science: *Primary Connections* Program**

End of Term 3 Professional Learning Facilitators Questionnaire

Dear Colleague

We seek your perceptions of your confidence and self-efficacy as a professional learning facilitator, information about your activity as a facilitator, and any issues or concerns with your role or resource or professional learning needs.

Data from this survey will be aggregated and summarised so that it will not be possible to identify any respondent in any reports of this research. Data will be used for research purposes only. We request your name for follow-up purposes only.

Please answer this questionnaire honestly and frankly. Respond in the way that it is, rather than portraying things as you would like them to be seen.



*Professor Mark W Hackling
Edith Cowan University*

ID number

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For office use only

Your background

Your name: _____

State/Territory: _____

Sector: Government / Catholic / Independent / Other

Name of workplace for 2006: _____

Your professional role for 2006: _____

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Your self-efficacy and confidence as a professional learning facilitator

Please indicate the degree to which you agree or disagree with each statement below by ticking the appropriate box to the right of each statement:

SA = Strongly Agree; A = Agree; UN = Uncertain;
D = Disagree; SD = Strongly Disagree

Item	Statement	SA	A	UN	D	SD
1	I am effective in eliciting teachers' prior knowledge and beliefs and adjusting the professional learning workshop to meet the needs of the teachers					
2	My science content knowledge enables me to answer teachers' science questions effectively					
3	My knowledge of effective science teaching practices enables me to answer teachers' science pedagogy questions effectively					
4	I am quite comfortable with having my professional learning workshops evaluated					
5	I am able to pose engaging tasks for teachers to work on in small groups in my workshops					
6	My deep understanding of the culture of primary schooling enables me to give valuable advice to teachers on matters of primary science pedagogy					
7	My deep understanding of the culture of early childhood education enables me to give valuable advice to ECE teachers about science pedagogy					
8	My deep understanding of literacy teaching practice enables me to give valuable advice on integrating literacy education into science education					

OFFICE USE	
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sef1	
sef2	
sef3	
sef4	
sef5	
sef6	
sef7	
sef8	
cfac1	
cfac2	
cfac3	
cfac4	
cfac5	
cfac6	
cfac7	
cfac8	

Please rate your confidence with facilitating professional learning workshops on the following aspects of primary science and literacy teaching

VC = Very confident; C = Confident;
LC = Limited confidence; NC = No confidence

Item	Aspect	VC	C	OK	LC	NC
1	An introduction to <i>Primary Connections</i>					
2	Coordinating the science program in a primary school					
3	Auditing current practice					
4	Assessment of learning in primary science					
5	Conducting investigations in primary science					
6	Cooperative learning strategies					
7	Developing literacies needed for learning science					
8	Using an inquiry model to plan primary science units of work					

What types of *Primary Connections* professional learning activities have you engaged-in during Term 2 and Term 3?

Code	Activity	Number of times
1	Answering questions about <i>Primary Connections</i>	
2	Showed the <i>Primary Connections</i> curriculum units to a colleague	
3	Sharing your experiences with <i>Primary Connections</i> with colleagues.	
4	Teaching <i>Primary Connections</i>	
5	Engaged in journaling, analysing and reflecting on your own science teaching practice	
6	Observing a trial teacher/colleague teaching <i>Primary Connections</i>	
7	Invited a colleague to observe you teaching <i>Primary Connections</i>	
8	Visiting a <i>Primary Connections</i> trial school to see how they have organised the program within their school	
9	Engaged in gaining the Principal's support and planning for the implementation of <i>Primary Connections</i> at your school	
10	Made a short presentation outlining the features of <i>Primary Connections</i> to school staff	
11	Presented an information session for a group of school principals	
12	Presented an information session for a group of district/sector curriculum area leaders/policy officers/consultants	
13	Facilitated the Introduction to <i>Primary Connections</i> workshop	
14	Facilitated the School Coordinators workshop	
15	Facilitated the Auditing workshop	
16	Facilitated the Investigating workshop	
17	Facilitated the Assessment workshop	
18	Facilitated the Literacies of science workshop	
19	Shown video clips from the <i>Questioning Minds</i> DVD	
20	Other	
21	Have you presented a workshop or paper at a conference	
22	If yes, name of conference:	
23	If you have presented an information session or workshop at a school	
24	<ul style="list-style-type: none"> • Name of school: • Number of people who attended: 	

Planned professional learning activity

Are you currently scheduled to present any *Primary Connections* professional learning workshops in Term 4?

Yes / No (circle one option)

Which workshop? _____

Where will the workshop be presented? _____

When will it be presented? _____

Feedback on the resources for the *Primary Connections* professional learning workshops

If you have facilitated any of the *Primary Connections* professional learning workshops, please provide feedback on the resources for those workshops.

<i>Primary Connections</i> professional learning workshop module	How can the resources for this workshop be improved?

Feedback on your role

What factors are enabling you to be effective in your role as a *Primary Connections* professional learning facilitator?

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wsloc	
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rec1mod	
rec1imp	
rec2	
rec2mod	
rec2imp	
rec3	
rec3mod	
rec3imp	
eff1	
eff2	
eff3	

What factors are limiting your effectiveness as a *Primary Connections* professional learning facilitator?

What further support (resources, training etc) do you need for your role as a *Primary Connections* professional learning facilitator?

Any other comments

Thank you for responding to this questionnaire

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lim1	
lim2	
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sup1	
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oth1	
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