School mathematics leaders' beliefs about their role when participating in a school mathematics project

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Are you a mathematics leader in your school? In this article Matt Sexton and Ann Downton explore the beliefs of a group of School Mathematics Leaders. They also provide some useful questions for leaders of mathematics to reflect upon.

It is not uncommon in many Australian primary schools for a teaching staff member to undertake the leadership or coordination of mathematics in his or her school. Some research (e.g., Cheeseman & Clarke, 2005) suggests that coordinators and leaders play an important role in the leadership and management of mathematics teaching and learning in primary schools. We believe that many readers of APMC are current or future mathematics leaders or coordinators, and it is for this audience that we share some insights from data that we collected when working in a recent school mathematics project. An aim of this article is to prompt leaders and coordinators of the mathematics curriculum to reflect on their beliefs about their role, comparing and contrasting these with the beliefs held by leaders who were involved in the aforementioned project.

Background

Contemporary Teaching and Learning of Mathematics (CTLM) was a research and professional development project designed and facilitated by staff from Australian Catholic University (ACU, Melbourne Campus) and funded by the Catholic Education Office Melbourne (Clarke et al., 2012). CTLM was a five year project (2008 to 2012 inclusive) that aimed to improve mathematics teaching and learning practices in participating schools. Four intakes of schools participated in the project for a two-year period. A large focus of the project concerned the provision of professional development sessions, facilitated through plenary (lecture) sessions and workshops. These sessions were designed to enhance teachers' mathematical knowledge for teaching (Ball, Thames & Phelps, 2008) which is a specialised blend of subject matter knowledge and pedagogical content knowledge related to mathematics learning and teaching.

During their participation in CTLM, schools were required to appoint a staff member to undertake the leadership role of the School Mathematics Leader (SML). This leader had the task of supporting classroom teachers as changes in mathematics teaching and learning practices were enacted within the school communities. For many of these leaders, this was the first time that they were required to undertake leadership responsibilities of this nature. They played a vital role in leading the implementation of CTLM practices, strategies and philosophies in their schools.

Participants and data collection

Little is known about the leadership role of mathematics curriculum leaders in primary schools, so in 2012 we saw an opportunity to gain some insights into this important school leadership role. We collected data from 25 SMLs from 23 of the schools that participated in the final year of the CTLM project (Intake 4).

At the time of completing the survey, the schools were coming to the end of their two year participation in the project. Data were collected in November 2012 via an open-ended written response survey. The survey was designed to collect information about the leadership role including: the time fraction allocated to the SML role; the beliefs and purpose(s) of such a role in the school; and, the successes and challenges associated with the role. The responses were collated and then categorised according to themes that emerged from the data using codes (Miles & Huberman, 1994). In many cases, sub-themes also emerged from the major themes.

In this article, we report the data that relate to the responses about the beliefs that the SMLs held about the purpose of their role. We recognise that the responses provided through an open-ended survey often capture what is at the forefront of the person's thinking at the time of responding to the survey. This might mean that some themes are over or less represented than others in the results. However, we believe that these results make known some of the beliefs that the leaders had about their role.

Results

Given that an open-ended survey was used, many of the SMLs provided several responses concerning their beliefs about the purpose of their leadership role. Table 1 presents the themes that emerged from the data analysis.

Perceiving the SML role as one of *facilitator of professional learning* appeared in more than two-thirds of the responses from these leaders. In the responses grouped into this theme, the term "professional learning" was explicitly used by the SMLs. This is interesting because certain research (e.g., Millett & Johnson, 2004) suggests that the mathematics curriculum leader is the most immediate source of professional development for teachers in primary schools.

Approximately one-third of the SMLs reported that their role was *facilitator of change.* Terms that were common in the responses grouped into this theme included "improvement", "change", and "develop". These terms were used to describe changes in both teaching and learning with a focus on collecting and analysing assessment data, and guiding change as articulated in the school's improvement plan for mathematics.

Two of the themes had the same frequency (28%) of responses. The first relates to the role being one of a facilitator of teachers' mathematics planning practices, and the other is associated with monitoring the implementation of the CTLM project within the school. The focus on mathematics planning practices suggests that the SMLs placed importance on this aspect of their

Table 1. Beliefs that Intake 4 SMLs held about the purpose of their role (n=25).

Theme	Frequency of responses
Facilitator of professional learning in mathematics for teachers	17 (68%)
Facilitator of change in mathematics teaching and student learning (monitoring assessment data; focus on improvement as decided by improvement plans)	8 (32%)
Developer of teachers' mathematics planning processes	7 (28%)
Monitor of CTLM implementation (ensuring use of CTLM-promoted tasks and pedagogies in classrooms)	7 (28%)
Cultivator of positive cultures and 'whole school approaches' with mathematics education (raising the profile of mathematics; building on positive CTLM experiences; developing common teaching practices across the school)	6 (24%)
Facilitator of growth in teachers' pedagogical content knowledge	5 (20%)
Manager of organisational, human and physical resources (organising timetables for school visits; ordering resources and managing budgets)	3 (12%)
Communicator of information between CTLM stakeholders (liaising between leadership teams and teachers, ACU and CEOM staff and teachers)	1 (4%)

teachers' work. The responses grouped into the theme of *monitor of CTLM implementation* contained terms such as "ensure" and "oversee". These terms were used to describe the monitoring of teachers' work in embedding practices highlighted during the CTLM professional learning plenary sessions and workshops.

Approximately one-quarter of the SMLs saw their role as one that was linked to being a cultivator of a culture that saw mathematics as a priority for the whole school. Some of the responses grouped into this theme were related to raising the profile of mathematics as an important curriculum area, keeping mathematics on the school improvement agenda, and developing positive attitudes towards to mathematics.

Of particular interest to us was the theme that arose from responses that associated the role to one of facilitator of growth in teachers' pedagogical content knowledge (PCK). Five of the SMLs' responses were categorised within this theme, with one response explicitly stating that the SML role was "to develop teacher PCK". The final two themes are clearly linked to management aspects of the SML role, with organisation of human and physical resources, and communication between CTLM stakeholders.

These findings show that many of the SMLs saw their role in multi-faceted ways. These findings also indicate that the leaders viewed their role as one concerned with the facilitation of professional learning for the classroom teachers in their schools. The themes that emerged from the data analysis suggest that the SMLs perceived their role as one that led mathematics learning for teachers and students as opposed to one that was only concerned with the management of the CTLM project and resources associated with the mathematics curriculum.

Consider your leadership or coordination in light of insights

Even though these mathematics leaders were involved in a project which was supported by a university and an education office, these results have the potential to be used by mathematics leaders/coordinators for reflection on the purpose(s) of their role. To support this reflection, we have developed a set of questions that might prove to be a helpful tool for the readers of APMC who enact similar roles within their school community.

- What do you believe is the purpose of your mathematics leadership/coordinator role in your school?
- Compare your belief(s) with those from the leaders from whom we collected data. What is similar about your belief(s)? What is different? Why might this be the case?
- What structures are in place at your school that support the enactment of your beliefs about your role? What structures do not enable this to happen?
- How much of your role is dedicated to mathematics teaching and learning? What opportunities exist for you to develop this aspect of your leadership role?

Through this article, we have shared insights that provide an increased awareness of the various beliefs that mathematics leaders held about their role. While we suggest that readers might like to reflect on their own beliefs about the purpose(s) of their role, it might also be valuable for readers to seek the perceptions that colleagues hold about the mathematics leadership/coordinator role. Doing so might provide a shared vision for the leadership/coordination role in the school. This shared vision could be used to suggest and possibly set up structures to support the leadership/coordination of the mathematics curriculum in primary schools.

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