

**Parent Newsletters supporting Mathematics
in the Junior Primary School
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This paper presents research into the effect newsletters had on parental perceptions of junior school mathematics. Information on classroom content allowed parents to recognise and individualise mathematics that occurred spontaneously in the home. Interviews of parents and teachers revealed discrepancies in the way mathematics was viewed. All the teachers and participating parents were positive about the benefits of the newsletters.

Introduction

Parental involvement

Research overwhelmingly endorses the benefits of increasing parental involvement. Ramsay, Harold, Hawk, Marriott and Poskitt (1992) summarise a review of international research: *there are major gains for parents, teachers and above all else students if caregivers, teachers and the school community can enter into a meaningful relationship in terms of the children's education* (p.168). Wylie and Smith's (1995) study of children's progress through the first three years of school in New Zealand gives an insight into why the children of high-contact parents are advantaged. They found that when children encountered difficulties teachers tended to put the onus on themselves to help the child or they limited their expectations, but

If there is regular informal contact with parents, and parents are seen as receptive by teachers, then such ordinary "humps" in learning paths can be discussed, and worked on co-operatively ... But if the contact is irregular, then it is much harder to talk of a child's progress, and in talking between teacher and parent, alight upon the (often) small things which cumulatively can make a difference. (p.95)

However large numbers of parents do not have regular contact with the teacher of their child (Epstein, 1987). If involvement is to be encouraged parents need to be given information about the school and its programmes (Ramsay et al., 1989).

Junior School Mathematics

New Zealand studies have revealed that parents have little knowledge of mathematics programmes in junior primary classrooms (Wylie & Smith, 1995). Visser and Walker (1993) found that nearly two thirds of parents did not know enough about their child's mathematics programme to comment on it. They recommended that newsletters be used to improve this. Cooper, Whitehead and Patrick's (1996) study of parent education in relation to mathematics found a regular written newsletter was parents' favoured method of receiving information.

Newsletters may also address the apparent difficulty children experience with transferring skills taught in the classroom to mathematics problems encountered in everyday living (Carragher, Carragher & Schliemann, 1985; Lave, 1988; McIntosh, Reys & Reys, 1992). Mathematics is sometimes so well embedded in everyday activities that it lacks visibility (Carr, 1992). Drawing parents' attention to the mathematical nature of routine household tasks may increase their awareness and result in a higher incidence of

explicit role modelling. This approach is used in a successful mathematics intervention programme at the new entrant level (Young-Loveridge, 1993).

The curriculum document for New Zealand schools stresses the need to teach mathematics “*in a meaningful context*” but researchers have documented how difficult it is for a classroom teacher of junior school children to do this effectively (Desforges & Cockburn, 1987). Tizard and Hughes (1984) identified three advantages parents have over teachers aiming to teach “*in a meaningful context*”: the extensive range of activities that take place within the home; the embedded nature of the learning; and the common memories shared by parent and child. Parents’ ability to use these advantages was examined in this research, which investigated the effect newsletters had on parents’ ability to support their child’s mathematics education.

Method

An action research methodology was used to trial and improve a regular newsletter. The newsletter aimed to increase parental awareness of mathematics in the Junior Primary School.

Figure 1: Sample mathematics newsletter used at Milland School.

Maths News

This week we’ve been copying patterns and using these words to describe positions: “first”, “second”, “third”. For instance:

- Our teacher gave us cards with patterns drawn on them. We had to use bottle-tops, rods, counters and cubes to finish the pattern.

\oplus	\square		\square	\oplus	\square
Δ	\square	\Rightarrow	\square	Δ	\square
\square	\oplus	\square		\square	\oplus

- In pairs we took turns at making our own alternating patterns and then asking our partner to carry them on.

$\oplus \square \oplus \square \oplus$	\Rightarrow	$\oplus \square \oplus \square \oplus \square \oplus \square \oplus$
our pattern		our partner carries it on

- We drew pictures of ourselves. The teacher lined up our pictures, telling us "Kahu is first, Jan is second, Maia is third" We had to line up in the same way and then checked our pictures to see if we were correct.

If you would like to support our classroom mathematics with activities at home you could help us look for patterns around us and ask us to describe them. If you’re looking for them you’ll probably see quite a few but to get you started we’ve made a list:

- left, right, left, right - an alternating pattern we make as we walk down the street.
- ”ring-ring - *pause* -ring-ring- *pause*- ring-ring” - the pattern of sound from the telephone .
- using blocks, buttons, bottle-tops or cotton reels to make unfinished pattern that we can complete. We could take turns at this with you.
- arranging our dinner vegetables or dessert in a pattern
- talking about what comes next. eg Jenny has opened the door, I’ve closed it, Alfie has opened the door, now what will happen next?

Have fun. Happy Mathematics!

Sampling

Initially five classes (from New Entrants to Year 2) trialed newsletters at Milland, a large primary school located in a military housing area. Feedback from parents and

teachers was used to modify the format and content for two subsequent cycles in a single Year 2/3 composite class at Pallace, a small urban school. Both schools were classed as decile eight on a SES scale of one to ten.

All participating parents were sent questionnaires and invited to individual interviews. This self-selection led to a homogenous interview group, whom the teachers categorised as “high-contact parents”. Five mothers and three teachers were interviewed at Milland. The parents of six children (six mothers and four fathers) and the teacher were all interviewed twice at Pallace. All interviews were semi-structured and took place in parents’ homes. The rapport established by the interviewer was demonstrated by the eagerness with which parents discussed a wide range of issues relating to their child’s mathematics and education in general.

Newsletters

Figure 1 shows a sample newsletter from Milland school. These were produced to match the activities in the Beginning School Mathematics (BSM) resource used in New Zealand schools. They were sent home approximately once a week, as children finished the activities. Subsequent newsletters at Pallace were longer but sent home approximately three weekly, in accordance with the topic-based programme which operated in that classroom.

Results

Mathematics - the forgotten subject

Before the newsletter parents reported that unless the parent had helped in the classroom during the day, they were unaware of the content of school mathematics lessons. Natasha’s mother summed up the situation:

I presume that Natasha is doing fine in her maths but I don’t actually know. You never really know. They bring their reading home so you know where they are with that. You tend to get an idea of what they’re doing in ... [language, handwriting, physical education, art and music]

Mathematics is the big mystery one really. I had no idea of what they were doing and I don’t really know how well she is going. I never think to ask her what she’s doing in maths and she never tells me anything that she’s doing. In fact it could be the forgotten subject ...

This ignorance of the content or their child’s progress in mathematics was mentioned by almost all the interviewed parents. The exceptions were Jack’s mother, a teacher aide who occasionally worked in her son’s class, and Joe’s mother who taught junior classes at another school. However, even Joe’s mother commented that the newsletter “served as a good reminder that every now and then these are the sort of things that I need to be talking about. Remembering when we go to the supermarket to talk about money and how many and the sizes...”

Parents remarked that, before the research interviews, they had been unaware of their relative ignorance of mathematics content and their child’s progress. It was only the interviews that had caused them to examine their knowledge of the mathematics covered in the classroom in relation to the other subjects. Three of the Milland mothers and one Pallace mother could not recall mathematics ever being mentioned at parent interviews. Milland School teachers agreed with the parents’ perception of the situation.

Hannah, one of the Milland teachers, noted that as a result of the newsletters she “got 20 out of 24 parents [attending the parent-teacher interviews] and probably 50 percent of them asked about maths and that’s unusual. They don’t usually ask about maths.”

The “code of silence” on the subject of mathematics was also reflected in the documentation Milland School gave to parents. No mention of mathematics is made in the “Beginning School” handbook which includes pages on reading, writing and becoming independent. Until the interviews, the teachers had been unaware that mathematics had been overlooked. Teachers reported that mathematics “took up too much room” to be included in the weekly homework sheets.

Parents’ actions in the absence of information

Despite mathematics being *the forgotten subject*, parents felt that it was a very important component of their child’s education. All of the interviewed parents had purchased books, magnetic numbers or games to support their child’s mathematics. In the case of the Year 1 and 2 children at Pallace, all the parents had undertaken some form of mathematics coaching: two showed the interviewer books of arithmetic facts, two had games advertised as increasing a child’s mathematics ability, and three had drilled their children on multiplication facts. In some families this support for rote learning of arithmetic began in the kindergarten years.

Leah has always done sums. Since she started school. It used to be quite a game to her. She used to do adding. She could add up to about 10+10. She would just look up at the ceiling and the next minute the answer would pop out.

[Jack learns times tables] how I learnt it. We used to start with “two ones are two, two twos are four...” calling out loud. And we talked about it because I think at that stage I was in his class as well and I heard them talking about two groups of three and two groups of four so we talked about it like that.

The emphasis that parents placed on early mastery of arithmetic facts is in direct contrast to the achievement objectives in the New Zealand Mathematics Curriculum which do not require recall of addition/subtraction facts until Level Two (approx Year 2-Year 6) and multiplication at Level Three (Year 4-Year 8).

Given the lack of information parents received about mathematics it is not surprising that wide discrepancies existed between the views of junior mathematics held by teachers and parents. A Milland teacher explained that parents “*think of maths as numbers. And when they don’t hit numbers straight away they get knocked. I regularly have parents say, “When are they going to have a book?” or “When are they going to start adding up?”* Many of the parents confirmed this view by mentioning their surprise at the “fun” nature of the mathematics they read about in the newsletter. Given that the interviewed parents were all high-contact, it could be expected that other parents are also ignorant of the decreased emphasis on rote learning of arithmetic skills.

Parents’ response to the newsletters

Questionnaire responses indicated that parents liked the newsletters. They liked knowing “what was going on”.

I asked about mathematics [before the newsletter] but she said “We are not doing any proper maths. We are just doing kindergarten

play". So when I got the newsletters, that made me aware that they did some sort of maths, even if at first she didn't realize it. It had a calming effect for myself. (Helga's mother)

For Joe's mother, who is a teacher herself, the newsletter "served as a reminder that every now and then these are the things I need to be talking about". For most of the other parents the content was surprising: "I never thought of doing anything like that before. I mean I would have done it when I was at school but I certainly didn't think of doing it" (Donald's mother).

All of the interviewed parents wanted the newsletters to continue. Two recalled past experiences of themselves as students bringing home mathematics in Secondary School. "My Mum couldn't help me once I got to College - just didn't even want to try. If we got these [newsletters] right through, then we'd be learning with our children and we'd never have that sort of problem" (Rachael's mother).

Nineteen of the 22 parents responding to the questionnaire said they tried *Maths News* activities. Most had adapted activities to fit their resources and the personal interests of their children (including younger siblings). Natasha's mother talked about dinosaurs; Tony's parents counted deciduous trees in twos and fives; Jack's mother talked with her daughter about cutting sandwiches into quarters and halves. This flexibility appeared to result from being aware of what was being studied in the classroom. Perhaps the best example was given by Linda's parents who searched their house on a spontaneous "Roman Numeral Hunt"; finding a watch, chapter headings in books and TV programmes that featured roman numerals. Linda then gave her mother a formal lesson on the value of Roman Numerals - and even devised a test which was sat (and passed) by both parents!

Newsletters affected the way mathematics was viewed at home

Parents reported that the newsletters had made mathematics in their daily routines more visible:

"... things like bigger than, smaller than. You don't realize how much you talk to your children about maths until it is brought to your attention .. " (Liz's Mother)

Mother: *It just makes your everyday thinking more aware. Like setting the table: "If two of us are going to be away tonight then how many knives will we need?" and things like that because when you are not mathematically minded it is helpful to have reminders about what you could be doing.*

Int: *Things you do anyway?*

Father: *Yes. We've just been having [a mathematics conversation] a few seconds ago. What is the temperature tomorrow? 16 degrees ... That sort of thing we do all the time. But I must admit that this is only since*

Mother: *The newsletters sort of made us more aware..*

Father: *The newsletters probably started us off down that track.*

(Adele's parents)

An additional bonus of the newsletter was the flow-on effect to siblings. Six of the children's parents reported that the newsletters were useful for younger children.

“... our four year old as well. He was busy eating “one quarter of my toast”. That was exactly what he said!” (Jack’s mother)

[It is] so easy to teach them if you know that they will be doing that at school. I’m keeping all these [newsletters] and I’ll know what [two-year-old] Jessie needs when she goes to school.

(Rachael’s mother)

Parents were conscious of the limited time they had to spend with their children. Some spoke of the need to give their child a break from schoolwork when they came home, or described the constraints on their own time. Yet, when it was suggested that the newsletters perhaps asked parents to do too much or “increased guilt”, all but one disagreed strongly. It appears that the tone of the newsletter had minimized any feelings of compulsion. In contrast to the school situation, where teachers reported difficulties individualising work or giving examples in context for the children; parents’ anecdotes were almost always in a natural context. The most common parent reaction to the newsletter was to include “mathematics talk” during their normal routines, without devoting extra time to mathematics. They were less likely to complete a suggested activity similar to “classroom mathematics”, although some did and reported that they had enjoyed them.

Father: Routine things are easy because it is just remembering to say it, but occasionally we’d do homework and it would be part of that. But you’ve got to actually sit down ... and it is the time ...

Int: Would you have been doing that anyway?

Mother: Now we talked about [mathematics]. It made you more aware of what you were doing. Normally you just have the shape in front of you but you wouldn’t particularly notice anything about it.

(Linda’s parents)

Teachers’ response to the newsletters

Teachers were also in favour of the newsletters but were unsure as to how universal the benefits were. For instance Wilma, (a Milland teacher) was enthusiastic about the benefits of the newsletter for a particular child with special needs, whose mother was given the newsletter before the class had tried the activity. “[The child] is working at about an average level in the class. She wouldn’t be there if it wasn’t for her mother going through the work with her first.” But Wilma was more cautious about attributing the other improvements she had observed to the newsletters. For instance she noted that her whole class had been much faster in developing an understanding of one-to-one correspondence than in previous years, but she wondered if this was due to the newsletter or changes at the local early childhood facility.

Hannah felt that the newsletters were being read and used by her “good” parents but ignored by the others. She saw this as being of little value since she expected that the “good” parents were doing mathematics with their children anyway.

You can always pick the ones that get it from parents because they’re the ones that are way ahead. My [BSM cycle 8, module 2] ones. I know the parents have put a lot into them before they even come to school and continue to do so. And that’s why they are way up on 8-2.

The key benefit of the newsletter identified by all the interviewed teachers was that the parents were shown the “correct” algorithms for the classroom mathematics. Teachers were not in favour of parents “teaching” and, when asked to comment, they discouraged parents from attempting. Yet they accepted that some parents would teach mathematics to their children no matter what advice was given. Teachers anticipated that the newsletter would minimize the problems caused, because the methods demonstrated by parents would be the same as those learnt in school.

Table 1: Differing perceptions of Junior School Mathematics

Teachers' Views	Parents' Views
Early mathematics involves a range of generic skills; comparison and relationships, shape, movement and position, classification order and pattern.	Early mathematics is about learning to count, learning to add and subtract, and later on; learning the times tables, before mastering algorithms for arithmetic with large numbers.
Delaying written mathematics gives children the opportunity to develop their mathematical ideas through guided exploration with materials.	Written mathematics should be introduced as soon as possible. Worksheet-type activities where children write numerals to represent the number of objects shown are the starting point for mathematics.
Children build their own knowledge of mathematics through experience. Teachers can assist through questions that prompt the child to re-examine their own understanding.	Children learn mathematics by being taught methods and by memorising basic facts. Parents can help by giving children extensive exposure to arithmetic facts at an early age.
Teaching mathematics in context is a noble ideal but very difficult to do in practice in the classroom. Planning is too extreme and real individualisation is impossible.	It is sometimes difficult to find time to complete set activities or mathematics homework but it is very easy to incorporate mathematical vocabulary and thinking into everyday situations.

Discussion

The interviews revealed a number of discrepancies between teachers' and parents' views of mathematics. These are summarised in Table 1. In many cases these differences are masked by the way in which both groups appear to view mathematics as “the forgotten subject”; of secondary importance to the development of language skills.

The regular newsletter proved to effective in modifying parental views of the first three items in the table, by giving parents exposure to the teacher's view of mathematics. Data from the interviews showed that newsletters expanded parents' view of mathematics (more than just arithmetic). The newsletters gave parents access to the teachers' justification for a delayed introduction of symbols and written recording of equations. Newsletters also encouraged parents to adopt the accepted “teacher view” of

assisting children to develop mathematical understanding through questioning and prompting rather than rote learning basic facts. While parents still placed a great deal of emphasis on basic facts, in some cases this was modified by a focus on understanding.

In terms of the child's learning, the most important effect of the newsletter was the way parents were able to support classroom mathematics with more contextual problem solving. In contrast to the teachers, parents reported no difficulty in teaching *in a meaningful context*. Sharing the current classroom mathematics with home allowed parents to better support their child's mathematics *in a way teachers could not*. Parents showed skill, creativity and sensitivity to their child's needs. They reported that that it was "easy" to find time for contextualized mathematics in their normal routines *if they knew what the children were studying and how to apply it*. The findings of this research raises questions about the effectiveness of traditional mathematics homework tasks which often imitate the decontextualized mathematics or artificial exercises that are commonly seen in the classroom.

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