PREPARING FOR SCHOOL TRANSITION: LISTENING TO THE STUDENT, TEACHER, AND PARENT VOICE

BRENDA BICKNELL
Waikato University
b.bicknell@waikato.ac.nz

ROBERTA HUNTER
Massey University
r.hunter@massey.ac.nz

Moving on from primary school provides many different challenges. This paper explores multiple perspectives about preparation for school transition in mathematics. As a qualitative case study it draws on student, teacher, and parent, voices through the use of questionnaires and interviews. Sixty seven students and six teachers from three different schools participated in the study. There were commonalities and differences in beliefs about mathematics learning and teaching that contribute towards successful transition. The results illustrated that facilitating successful transitions requires that attention be given to the perceptions and values of students, teachers, and parents.

Introduction

For all students, transition across educational sectors is an important event in their schooling lives, whether as an internal transfer (e.g., from junior school to senior school) or as an external transfer (e.g., from primary school to middle school). A body of literature (e.g., Anderson, Jacobs, Schramm, & Splittgerber, 2000; Demetriou, Goalen, & Rudduck, 2000; Galton, & Hargreaves, 2002) signals the many challenges which students may encounter at this important time. Broadly, these challenges include difficulties with continuities in learning mathematics, teaching styles, teacher expectations, friendships, and school systems. Recent New Zealand studies by the authors (Bicknell, 2009; Bicknell, Burgess, & Hunter, 2010; Bicknell & Hunter, 2009) explored different aspects of the transition process. The focus of these studies was on preparedness, support, and transitional success and failure across differing sectors for students in mathematics.

Preparedness includes academic preparedness, independence, and industriousness. Support may be provided by teachers, parents, and/or peers whilst transitional success or failure can be judged by grades and academic orientation. These were the three key elements for analysis provided by Anderson et al's (2000) conceptual framework. This paper provides an opportunity for us to address in more detail the issue of preparedness and to hear multiple voices of students, teachers, and parents. We want to understand how these three stakeholders view preparedness in mathematics for successful transition from primary school. Our research question asked: How do students, teachers, and parents view preparedness for a successful transition in mathematics?

Review of the literature

Successful transition is not only important for students' social and learning trajectories (Noyes, 2006) but also to maintain their motivation to continue to engage with mathematics (Athanasiou, & Philippou, 2006). One reason Akos, Shoffner, and Ellis (2007) suggest students lose interest in mathematics is due to the increased focus placed on performance-oriented teaching and learning as students move up the schooling system. This performance orientation emphasises student demonstration of mathematical skills and increased competition at higher levels of the education sector and contrasts with the more task-orientated focus of primary school classrooms. Within a task-orientated focus, emphasis is placed on students working to improve their competencies (Zanobini & Usai, 2002). In recent times, certainly in New Zealand, primary mathematics classrooms have been strongly orientated towards task-focused teaching and learning through the New Zealand Numeracy Development Projects (NDP) (Ministry of Education (MoE), 2008). However, as students move into higher sectors in the New Zealand school system the focus shifts towards more assessment-driven pedagogies.

Noyes (2004) describes this shifting emphasis in pedagogy as schools being responsive to political influences within "mathematics learning landscapes" (p. 28). While policy has a broad influence on what happens in mathematics classrooms, other more local factors impact on the transition process in individual schools and classrooms. The barriers and enablers to successful transitions vary depending on differing contexts and situations. They involve more than individual students. Teachers (Pietarinen, 2000), parents (Mizelle, 2005; Cox & Kennedy, 2008), and peers, (Wentzel & Caldwell, 1997) all play a key role in the transition process (Jindal-Snape & Foggie, 2008).

> It is widely accepted that fluency should be underpinned by the continuity and progression designed into the curriculum, by the efficient and purposeful transfer of information at the interface and by comprehensive liaison between the various parties involved: teachers, pupils and parents. (Nicholls & Gardner, 1999, pp. 1–2)

Of particular interest for this study is how continuity in the mathematics learning landscapes is enacted across mathematics classrooms at each sector level; that is how the cultures of classrooms at primary level (as the students and their teachers perceive it) links to how the students, their teachers, and their parents perceive how this supports their preparedness to transition to middle school. Such continuity of learning has been identified by researchers as an area of action that will improve learning across transitions.

In this paper we take the culture of the classroom enacted by teachers as a key factor which shapes students' relationships in and with mathematics. We explore how students view the culture of the mathematics classroom in preparedness for transition and acknowledge the influence of recent reforms in mathematics education (founded in constructivist learning theories in which students construct, explain, and justify their reasoning using multiple strategies). This led us to listen to student voices to see how they view their current classroom culture and how they see this as preparation for transitioning to middle school mathematics learning.

The theoretical perspective taken in this study adopts an ecological view suggested by Bronfenbrenner (1979). In this cultural frame the different social environments are recognised as directly impacting on students as they prepare to make an "ecological

transition" (p. 26) across school sectors and make adaptations on multiple levels to the perceived changes in roles and settings they will encounter.

The study

This paper reports on data extracted from a larger study that investigated the different transitions of groups of students within centres and school sectors across a three-year period. In a previous paper (see Bicknell & Hunter, 2009) we reported on the systemic transition in mathematics of students in the second phase of the study (primary school year six to intermediate school year seven). In this paper we return to the findings from the second phase to investigate how the mathematics learning environments (classroom cultures) are directly responsive to the New Zealand Numeracy Project (MoE, 2008). Further, we are interested to see how how year six students, their teachers, and their parents view preparedness for mathematics in the next sector.

The sample for this study included 67 students (65 returned complete questionnaires) and their teachers (n=6) from six different schools. The six primary schools were from a decile[1] range of three to seven from two different geographical regions in New Zealand. The students completed a questionnaire that included both open-ended and likert scale questions. This was supplemented by group interviews. The teachers also completed an open-ended questionnaire and participated in semi-structured interviews. The parents (n=34) also completed a questionnaire. To determine the key themes and the commonalities and differences in perceptions about the transition process, responses were systematically coded initially based on Anderson and colleague's (2000) conceptual framework. This was followed by a second level of coding. Tables were then created for some of the pattern codes to give a quantitative view of the data from the multiple sources (Cohen, Manion, & Morrison, 2007).

Results

The classroom contexts

All teachers reported that they had recently participated in numeracy professional development provided for the New Zealand Numeracy Development Projects (MoE, 2008) and placed an emphasis on numeracy in their mathematics programme (between 60-100%). Key features of all of the teachers' lessons (as reported and documented) included the use of streamed groups (based on strategy levels). Their lessons featured an introductory basic facts whole class activity followed by group rotations where students developed solution strategies for problems in small groups and talked about their strategies with the teacher in larger sharing sessions. Follow-up work included activities to reinforce previous learning through the use of numeracy resource materials. These lessons reflect the model promoted by the New Zealand Numeracy Development Projects.

[1] Each school in New Zealand is assigned a decile ranking between 1 (low) and 10 (high) based on the latest census information about the education and income levels of the adults living in the households of students who attend that school.

The students concurred with their teachers and they almost uniformly described working in groups and working with the teacher as a key aspect of their mathematics lessons. The majority of the students noted that the learning of basic facts was consistently a focus of mathematical activity. Other activities the students listed as common practice in their mathematics lessons included working from textbooks and worksheets and explaining their strategy solutions. The least common occurring activities were writing their own word problems, participating in competitions, and convincing others about their mathematical thinking.

In the next section we present firstly the students' perceptions of their preparation to transition to middle school in mathematics. This is followed by the teachers' and parents' perceptions. Then we provide a synthesis of the three voices in which we highlight commonalities and differences among the stakeholders.

Student perceptions of their preparation for transition in mathematics

The students presented their ideas initially in a written questionnaire. Table 1 below provides a summary of student responses to the question: How important do you think each of the following are in preparing you to do well in mathematics?

Table 1. Student Responses to Question 4.

	Extremely important	Very important	Somewhat important	Not important
Working in a group with other students	8	37	18	2
Working alone	15	19	27	4
Working with the teacher	31	20	11	3
Sharing your ideas in a large group	23	26	13	3
Working from a textbook	13	20	27	5
Working from a worksheet	7	30	22	6
Learning using games and activities	20	19	21	5
Knowing your basic facts	47	12	4	6
Being able to use a calculator	21	27	10	7
Explaining your strategy solutions	30	25	5	5
Convincing others about your mathematical thinking	17	31	15	2
Writing your own word problems	11	28	24	2
Learning from your mistakes in mathematics	42	18	1	4
Learning from the mistakes of others	20	27	12	6
Being able to ask for help in mathematics	40	21	3	1
Taking part in competitions	16	24	19	6

Table 1 shows that the factors that related to students' attitudes towards, and ways of participating in, mathematics drew the most positive responses. The strongest placed factor ranked by the students as either extremely important or very important was 'being able to ask for help' (94%). This was followed closely by 'learning from your mistakes in mathematics' (92%) and 'knowing your basic facts' (91%). The selection of these factors suggests that the students had a sense of responsibility and autonomy towards

themselves as mathematical learners. They also illustrate a task-focused orientation in which the students are doing what Zanobini and Usai (2002) describe as improving aspects of their mathematical competencies.

The second group of responses included: explaining your strategy solutions (85%); working with the teacher (78%); sharing your ideas in a large group (75%); convincing others about your mathematical thinking (74%); learning from the mistakes of others (72%); and working in a group with other students (69%). The selection of these factors by the students reflects a focus on them taking personal responsibility for their mathematical learning and at the same time illustrates the importance the students placed on ways of communicating about, and participating in, mathematics. However, only half of the students believed that working from a worksheet (51%), working alone (52%), and working from a text book (51%) were important in preparing them for mathematics in their next school setting. These three factors more closely represent mathematics learning within performance-orientated settings.

The findings in Table 1 were triangulated using additional data from an open-ended question in the questionnaire and focus group interviews. The open-ended question asked: What do you think are the most important things to do to be prepared for mathematics in year 7? The students' responses provided further evidence that they believed that they needed to improve their mathematical competencies. They were also aware of an attribute Anderson and his colleagues (2000) describe as essential for preparedness, which is industriousness. This is exemplified by a student who noted:

> Work very hard when it's getting closer to the end of the year; learn all the basic things you should know in year 6 so you're prepared for the next year. (Student D5)

A second student commented:

> ... make sure that I know my basic facts well, know how to do word problems and work well with new people. (Student C8)

This student perceived the importance of group work as equipping him to continue to work with others including a new teacher when he transitioned to his new school. Other students also noted that they viewed the ability to work in groups, work with other students, show their ways of thinking (publicly), know how to use different methods and strategies, and learn from mistakes as important aspects of preparedness for transition. For example one student stated:

> I think I have to ask the teacher for help a lot. And always give ideas to the group that I'm working with and speak up. (Student E5)

Other students illustrated that they recognised that their current ways of working would change in the next setting. These students identified that part of their preparation required that they worked independently, harder, and were prepared for challenge. For example one student recorded a need to:

> ... be prepared for a challenge, new types of working and working with your new teachers and classmates. (Student F1)

The students were asked how they thought their teachers were preparing them mathematically for transition to the next schooling sector. Across the sample they provided similar responses. Most often they stated that they were encouraged by their teachers to work alone. Many stated that their teachers now gave them worksheets and

had them working from text books as a preparatory step. Accepting greater challenge, taking personal responsibility, and increased homework was also mentioned. As one student stated:

> Our teacher challenges us and gives us different work nearly every day and we either get a maths book like a text book or just a sheet and we work off those and each time there are different levels and challenging levels for your group and like for homework it will be hard for us and so we do quite hard questions now. (Student M1)

A large number of students also described how their teachers were focusing on teaching them more numeracy solution strategies (NDP mental strategies) in preparation for what the teachers perceived would be required in the new school. However, they themselves did not see the learning of multiple strategies as an important part of their preparation for transition. Similarly, the other factors which the students identified in this final section (textbooks, worksheets) are those which only 50% of the students thought were important to prepare them for the move to the next stage in their schooling. This however was the students' perceptions of what were important aspects of their preparation and as the next section will show differed somewhat from that of their teachers.

Teacher perceptions of preparing the students for transition in mathematics

The majority of the teachers described the importance of the students holding strong knowledge of their basic facts. Like their students, the teachers took a task-orientated focus (Zanobini & Usai, 2002) and described an emphasis placed on improving aspects of their students' competencies across mathematical skills and strands. For example, one teacher described a broad emphasis across the mathematics strands:

> Ensure that they have basic facts 'down pat'. Lots of exposure to a variety of strategies and problem solving skills. Experience in all maths strands. Above [all] give them the confidence to take risks with their thinking. (Teacher F)

Other teachers described a central focus on the teaching of numeracy strategies. They stated that they wanted to ensure that the students had a repertoire of strategies; a focus which fitted within the current politically focused NDP and connects to what Noyes (2004) suggests as the influence of wider policy. But, at the same time they outlined how they wanted the students to have had experience with the written standard algorithms for the four operations; a focus complicit with previous teaching methods prior to the introduction of the NDP. Other themes the teachers described included ensuring student knowledge of place value and developing a range of problem solving strategies. Some teachers also demonstrated that they were aware of a need to make mathematics relevant to their students' lives, to developing student confidence to take risks with their thinking, and have the skills and confidence to use textbooks. One teacher specifically focussed on her goal to increase her students' awareness of their own levels of achievement and weaknesses so they could take shared responsibility in identifying the next steps in their learning. She stated:

> My transition approach is the same with all areas [curriculum]. I ensure the child is aware of their level, what they can do, what their next steps are. Some children take this on board many don't. (Teacher E)

Like their students, the general focus of the teachers' preparatory steps was directed towards ensuring that gaps were filled for individual students within a task-orientated focus (Zanobini & Usai, 2002). However, they also addressed other aspects of preparedness that Anderson and his colleagues (2000) maintain are essential for successful transition. These focused on the need to develop independence, industriousness, and coping mechanisms.

Parent perceptions of preparing the students for transition in mathematics

Parents balanced their perceptions of what they wanted in preparedness for transition between wanting their children to be competent across mathematical dimensions and being able to perform competently at the next level. This included the mastery of basic facts which they saw as not only the responsibility of the school or teachers but also acknowledged their contribution towards their children's rapid recall of basic facts. They also placed importance on coverage of the curriculum; they wanted there to be no gaps in their child's mathematics education. They also wanted the mathematics lessons to be targeted at the student's level with clear progressions.

The parents, like the teachers, recognised a need to develop a range of coping skills as well as a sense of independence and industriousness. These included helping the children to work in a variety of ways: to work from worksheets and textbooks; to work independently; and to work under pressure. One parent stated:

> I feel he will either 'sink or swim' depending on how he starts the year (Year 7). If he finds it too difficult at beginning he will lose interest in doing well. I am hopeful he will do well and am preparing him and myself to get stuck into the new year's studies, as I think he might need help initially to settle into a work routine. (Parent C1)

Other aspects raised by the parents included the need for their children to have a positive attitude, self confidence, and a willingness to ask for help in mathematics. They also identified the importance of listening to the teacher, asking questions, risk-taking, and good work habits including accepting and working towards an increasing workload including homework.

The majority of the parents believed that the responsibility for the preparation rested predominantly with the school and teacher, although acknowledged that their support and encouragement would help with the transition. When mathematics was valued at home and links made to real life contexts, they believed, their children's preparedness for the transition was strengthened. However, not all parents felt that preparedness had been successful for their children; some had 'no idea' and one parent acknowledged concerns. Four parents stated that their children had not been prepared to succeed in mathematics in the following year but did not articulate reasons why.

Given that we received questionnaires from nearly 50% of the parents, we believe this could be viewed as reasonably strong parental interest in transition. It supports previous studies such as Mizelle's (2005) that parents are interested in the transition process although the level of commitment and sense of responsibility for preparedness, in this sample, was variable.

Conclusion and implications

Clearly, there were commonalities and differences between the groups of stakeholders. However, a common theme of preparedness was the importance of learning and mastery

of basic facts. This theme extended beyond basic facts to include coverage of the mathematics curriculum and for all stakeholders preparedness also meant ensuring competency across all mathematics strands. Voices from the three stakeholders all described the importance of improving competency in a variety of different ways. As other researchers (Akos, et al., 2007; Zanobini & Usai, 2002) previously noted, a task-orientated focus is consistent with students in lower levels of the education sector. Another theme common to the group, focused on the importance of preparedness to work from worksheets and textbooks within a more individualised setting. This focus could be linked to what Zanobini and Usai (2002) describe as the performance orientation of senior mathematics classrooms. We can infer that parent understandings of mathematics learning, most likely connects to their own most recent experiences in performance-orientated mathematics classrooms. Therefore, the parents' and the students' emphases on the importance of being able to work alone and to ask for help when needed can be understood, given the powerful influence Noyes (2004) suggests parents have on the attitudes of their children. At the same time, these factors and the value placed on homework by parents and students reflects notions of improving competencies (Zanobini & Usai, 2002) as well as ensuring what Anderson et al., (2000) describe as academic preparedness. The other factors Anderson and his colleagues drew our attention to in their research (independence, industriousness, and coping mechanisms) were also evident in what the teachers and parents considered important for preparedness for transition. The teachers and parents also placed an emphasis on student awareness of their own mathematical levels and learning needs, risk taking skills, and ability to cope with challenge including an increased workload. However, the parents were a lone voice in considering that a positive attitude to mathematics was essential for successful transition.

The influence of wider policy on the local classroom situation, described by Noyes (2004), is evident in the voices of the students and teachers. Only the teachers outlined a need to teach algorithms as important preparatory steps. We can surmise that this relates to previous policy and classroom practices which contrast with current policy introduced in the New Zealand Numeracy Development Project (MoE, 2008). Likewise, an emphasis placed by students and teachers on the development of a range of numeracy strategies links to current policy. This is a new construct and experience for many parents. Similarly, we can conclude that the prime importance the students placed on aspects of classroom practices and context (for example, working in groups, sharing reasoning, learning from mistakes, and convincing others) was shaped by broader and more recent policy. Moreover, we also need to recognise the discontinuities this poses for students. The culture of mathematics classrooms has changed in recent decades and if we are to ensure fluency in transition then we need to carefully consider how continuity of learning in mathematics is maintained. As Anderson and his colleagues (2000) caution, without paying attention to supporting a successful transition the transition becomes "the beginning of the end rather than a new beginning" (p. 336).

These findings suggest that there should be a shared understanding and recognition of the part that all stakeholders have in the process. We focused on student, teacher, and parent voices yet there are systemic factors that also need to be considered to support successful transitions. The mathematics curriculum needs to be presented and understood so the progressions across the sector are seen as seamless. Differing

pedagogical practices need to be respected and understood so that students can be prepared for any change in the learning landscape. Conversations and classroom observations across sectors could strengthen understanding and respect for the changed 'culture spaces' to support smooth and positive transitions for all students.

Acknowledgement

The authors wish to acknowledge that this project was funded through the New Zealand Ministry of Education's Numeracy Development Projects. The views expressed in this paper do not necessarily represent the views of the New Zealand Ministry of Education.

References

Akos, P., Shoffner, M., & Ellis, M. (2007). Mathematics placement and the transition to middle school. *Professional School Counselling, 10*(3), 238–244.

Anderson, L. W., Jacobs, J. Schramm, S., & Splittgerber, F. (2000). School transitions: Beginning of the end or a new beginning? *International Journal of Educational Research, 33*(4), 325–339.

Athanasiou, C., & Philippou, G. N. (2006). Motivation and perceptions of classroom culture in mathematics of students across grades 5 to 7. In J. Novotna, H. Moraova, M. Kratka & N. Stehlikova (Eds.), *Proceedings of the 30th Conference of the International Group for the Psychology of Mathematics Education* (Vol. 2, pp. 81–88). Prague, Czech Republic: Charles University.

Bicknell, B. A. (2009). *Multiple perspectives on the education of mathematically gifted and talented students.* PhD, Massey University, Palmerston North.

Bicknell, B., & Hunter, R. (2009). Explorations of year 6 to year 7 transition in numeracy. In Ministry of Education (Ed.), *Findings from the New Zealand Numeracy Development Projects 2008* (pp. 98–109). Wellington: Ministry of Education.

Bicknell, B., Burgess, T., & Hunter, R. (2010). Explorations of Year 8 to Year 9 Transition in Numeracy and Mathematics. In Ministry of Education (Ed.), *Findings from the New Zealand Numeracy Development Projects 2009* (pp. 145–157). Wellington: Ministry of Education.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). London: Routledge.

Cox, S., & Kennedy, S. (2008). *Students' achievements as they transition from primary to secondary schooling: Report No. 1 on the Students' transition from primary to secondary schooling study.* Wellington: Ministry of Education.

Demetriou, H., Goalen, P., & Rudduck, J. (2000). Academic performance, transfer, transition and friendship: Listening to the student voice. *International Journal of Educational Research, 33*(4), 425–441.

Galton, M., & Hargreaves, L. (2002). Transfer and transition. In L. Hargreaves & M. Galton (Eds.), *Transfer from the primary classroom: 20 years on* (pp. 1–27). London: RoutledgeFalmer.

Jindal-Snape, D., & Foggie, J. (2008). A holistic approach to primary-secondary transitions. *Improving Schools, 11*(1), 5–18.

Ministry of Education. (2008). *Book 3:Getting started*. Wellington, NZ: Ministry of Education.

Mizelle, N. B. (2005). Moving out of middle school. *Educational Leadership, 62*(7), 56–60.

Nicholls, G., & Gardner, J. (1999). *Pupils in transition: Moving between key stages.* London: Routledge.

Noyes, A. (2004). Learning landscapes. *British Educational Research Journal, 31*(1), 27–41.

Noyes, A. (2006). School transfer and the diffraction of learning trajectories. *Research Papers in Education, 21*(1), 43–62.

Pietarinen, J. (2000). Transfer to and study at secondary school in Finnish school culture: Developing schools on the basis of pupils' experiences. *International Journal of Educational Research, 33*(4), 383–400.

Wentzel, K. R., & Caldwell, K. (1997). Friendships, peer acceptance, and group membership: Relations to academic achievement in middle school. *Child Development, 68*(6), 1198–1209.

Zanobini, M., & Usai, C. (2002). Domain-specific self-concept and achievement motivation in the transition from primary to low middle school. *Educational Psychology, 22(*2), 203–217.