PRINT: ISSN 0975-1122 ONLINE: 2456-6322
Int J Edu Sci, 11(3): 244-252 (2015)
DOI: 10.31901/24566322.2015/11.03.02

Mathematics Learning in the Midst of School Transition from Primary to Secondary School

Vimolan Mudaly[1] and Swasthi Sukhdeo[2]

[1]University of KwaZulu-Natal (UKZN), South Africa
[2]Kharwastan Secondary School, Kharwastan, South Africa
E-mail: [1]<mudalyv@ukzn.ac.za>, [2]<sithalram@yahoo.com

KEYWORDS Communities of Practice. Habitus. Learner Self-image. Situated Learning. Theory of Practice

ABSTRACT This paper is based on a research study, which explored six primary school learners' transition to secondary school and the influences that this may have had on their mathematical learning and performances. The study was carried out over a seven-month period, from the latter part of their final primary school year until the end of the first term of high school. The study documented detailed descriptions of various stakeholders in the transition process as well as the factors that affect mathematics learning. The data reflects the findings of the study and discusses some of the implications regarding mathematics teaching and learning that should be considered during the transitional period from primary school to secondary school.

INTRODUCTION

There seems to exist a culture of blame between primary and secondary schools, and again between secondary schools and tertiary institutions regarding the learners' poor mathematical skills. This is perhaps mainly due to the fact that learners continue to perform poorly in mathematics, both in schools and at universities. Research and overall analysis of learner results in recent years indicates that there is a decline in mathematics performance in South African schools (McCarthy and Oliphant 2013; Alex and Mammen 2012; Taylor 2011). The results of international comparative surveys, such as the Third International Mathematics and Science Survey (TIMSS) raised further concerns (Mackay 2006). South Africa remained at the bottom of the performance table. There are various possible reasons for this decline in mathematics performance of South African learners. Mackay (2006:105) posits one possible explanation for this when he stated, *"changes at the transition to secondary school have been shown to be the cause of a number of negative effects on pupils, such as a drop in performance and decrease in self-esteem"*. West et al. (2010:21) also state, *"the transition from primary to secondary is probably one of the most difficult in the pupils' educational careers."*

This study examined the learners' primary school mathematics experiences in comparison to their secondary school mathematics experiences in order to understand why their performance in mathematics changed. The study sought to determine possible reasons for the decline in learners' performance in mathematics as they progressed from their junior years of schooling into the senior phase.

The study tapped into the learners' experiences during this transitional period in order to investigate factors that affect their mathematics learning. In attempting to investigate the dilemmas surrounding this transition process, three critical research questions formed the foundation of the study. The first attempted to determine how learners experienced their mathematics learning in the primary school phase as compared to the high school phase. The second considered how the transition process influenced the learners' mathematical performance. The third question sought to determine how the contextual factors in the transition process affected the learners' progress.

Anecdotal evidence is showing that the failure rate of learners in high school across the different grades rises steadily each year. When high school mathematics educators and subject heads are questioned in this regard, the response is that the mathematics foundations of exiting primary school learners are weak and learners have poor prior knowledge. In addition, there seems to be other compounding issues such as quality of education, lack of resources and continuous curriculum changes (Saul 2001).

Anecdotal evidence shows that the foundational mathematics is lacking, and hence the

researchers assume the poor performance of learners. It is this poor performance in assessments that increases the learners' fear and dislike for the subject thus creating much anxiety. In fact, Howard and Johnson (2004:1) state, *"students' transition between primary and high school can result in problems of truancy, school failure, non-compliance and inappropriate behavior in the early years of high school can often be attributed to the radical changes that occur in the students' day to day lives as they make the move from one school to the next."* Many teachers in junior secondary schools face learners that are seriously disillusioned and highly anxious. These learners display a poor understanding of very basic mathematical concepts, and show little inclination towards their work. Their morale is low despite having passed their primary school mathematics courses, some with very high marks. Despite their good grades in mathematics, they still struggle with the very basic concepts in mathematics. Parents show their concern by arguing that their children produced good results in primary school and now they barely pass. With this as the rationale, this research explored the learners' performance in mathematics in the transition from primary school to high school. The question that this paper attempts to answer is: What factors contribute to both the anxiety of learners and the decline in their mathematics results?

METHODOLOGY AND DESIGN

This study is underpinned by the interpretivist paradigm as it attempts to understand and explain the learners' and teachers' subjective experiences of the world of mathematics. This paradigm allows for the researchers to *"demonstrate human individualism and how their experiences are mediated by their thoughts, beliefs, expectations and judgments"* (Willing 2001:35). Willing (2001) also articulates the idea that individuals attribute meaning to events, which then shape their experiences of these events. The empirical evidence was gathered through the documenting of real events, recording what people said (words, gestures and tones), and studying written documents. Qualitative data was captured *"of the social world for which it is difficult to develop precise measures expressed as numbers"* (Neuman 2000:64). The research methods and methodology were informed by the two social learning theories.

A qualitative approach had been adopted, as the researchers were interested in the events that transpired during the transitive period between primary and secondary schools and how this influences teaching and learning of mathematics in the different environments. The study examined and questioned how some of the contextual factors affected this interactive process. This approach allowed the researchers the flexibility to probe both the learners and educators for deeper understanding. With the qualitative method, the researchers used a multi-method approach to gather, interpret and analyze the data. This enabled probing and an intensive analysis of the phenomena that emerged in order to obtain a deeper understanding. This approach also occurred as a case study, which investigated phenomena spanning seven months, and it still allowed for the examination and interpretation of discrete events and activities within this temporal space (Denzin and Lincoln 1994).

Both, the primary school and the secondary school were chosen from a well-developed suburb in Durban in the province of KwaZulu-Natal. These schools were public co-educational schools and both of them were easily accessible and made communication between schools quick and convenient. Learners from the primary school would generally feed into the secondary school. This made the chosen schools ideal for the research. This research closely examined the events related to the learners who moved between the chosen schools. Learners who chose to attend an alternate secondary school were not included in the sample. The sample was therefore quite purposive. Initially, eight Grade 7 learners volunteered to become participants with two participants then opting out of the research because one learner's parents were unhappy about her participation and the second learner chose to go to another secondary school. The sample was eventually six learners and three junior secondary school and one primary school mathematics teachers (refer to Tables 1 and 2).

The secondary school was built to accommodate 1000 learners but had an enrolment of 1200 learners and there were 600 learners registered in the primary school from grades R to 7. Grade R refers to a year of education before entering Grade 1. The schools were both multira-

Table 1: Characteristics of the learners' sample

Learner	*Age*	*Gender*	*Personality*
1. Tina	13	F	Very motivated, has high expectations of herself
2. Tammy	13	F	A little shy and seems to lack confidence in herself
3. Mary	13	F	Friendly, confident and motivated
4. Sam	13	F	Sweet, gentle lass who feels a little disillusioned
5. Nancy	13	F	Bubbly, playful and a little naughty
6. Mark	13	M	Care free, go with the flow kind of person

Table 2: Characteristics of the educators' sample

Educator	*Type of school*	*Age*	*Gender*	*Subject qualification*	*Teaching experience (Years)*
1. Sidney	Primary	45	M	Mathematics	24
2. Natasha	High	27	F	BSc Honours	5
3. Fathima	High	46	F	English, Music, ACE in Mathematics	14
				Mathematics	18
4. Sihle	High	38	M		

cial and both were fairly well resourced. These learners came from above average socioeconomic homes. Both the schools were well resourced and had experienced teachers on the staff. The secondary school also had technology for use in the mathematics classrooms. An external funder provider a substantial amount of money for the promotion of mathematics learning in the secondary school. This allowed the school to provide smart boards, computers and various software for the explicit use in these mathematics classrooms.

The interpretive paradigm was used to seek a systematic enquiry and understanding whether the transition process affected the learning of mathematics, and if it did, the factors in this process that may have contributed to poor learner performance in mathematics. Both the primary and secondary classrooms were observed as the respective teachers engaged in presenting their lessons and thereafter interviews were conducted with the teachers and the learners. Data was collected using classroom observations, the completion of questionnaires by the teachers and learners, interviews with the teachers and learners and finally, an analysis of the journals that the learners were encouraged to complete daily. Table 3 is a timetable of the data collection process.

Table 3: Timetable of the data collection process

Participants	*Interviews*	*Classroom observation*	*Questionnaires*	*Journals*
Primary school Educator Sidney	All interviewed once	Conducted once, whilst the learners were in their latter part of Grade 7	All teachers completed a questionnaire once	
High school educators Sihle Fathima Natasha		Done once ~~wh~~ilst the learners were in Grade 8		
Learners	Done in the latter part of the first term		Done in the latter part of the first term	Two journals were kept. One for the last term of the primary school and one for the first term of primary school
Tina Tammy Sam Mary Nancy				

Each teacher was observed only once (at each institution) in order to establish the school classroom setting and to establish his or her differences and similarities.

The questionnaires were used mainly for the purpose of acquiring information that could be used in the interviews. The questionnaires for educators elicited information related to qualifications, teaching experience, knowledge of primary school and high school curriculum, and how these teachers saw their role in the transition phase. The questionnaires for learners concentrated on three categories, namely, their mathematics learning experiences, a comparison of their primary school experiences with that in high school, and factors in the transition process that shaped and molded their performance. Questionnaires did not provide the opportunity to probe and interrogate responses received. To overcome that problem the participants also engaged in semi-structured interviews.

At the end of the first quarter of their first year at the secondary school (Grade 8), all the participants were engaged individually in a semi-structured interview. The choice of the end of the first quarter for the interview was ideal because it attempted to draw from the learners' memories of the primary school and the experiences they had in the secondary school, albeit for just three months. It was envisaged that the learners would be able to compare their experiences in both the schools with relative ease. The semi-structured interviews were used to guide the discussions, as the respondents were encouraged to express their ideas and opinions on related issues. This provided the researchers an ideal opportunity to probe deeper as greater understanding could be obtained. There were four aspects that guided the learners' interviews, namely, their learning environment, their feelings about mathematics as a subject, their opinions of the teachers' presentation of concepts, the way the learners' visualized some concepts taught in Grade 7 and continued into Grade 8, and finally, the issues related to their movement from primary school to secondary school. The interviews for the educators followed a similar pattern as that of the learners.

As part of their journals, learners were also asked write down their experiences of learning mathematics as they passed from one phase to another. In getting them to write their narratives, it was envisaged that they would craft stories of their experiences that would link different events, experiences and perceptions as they saw it (Goodson and Sykes 2001). The journals began in the last quarter of their Grade 7 year and continued into the Grade 8 year. Each learner was given a little lockable journal in Grade 7 and this was then collected at the end of the year. It was again given to the learners at the beginning of the following year. This was then collected at the end of the first quarter. Learners were encouraged to reflect on their experiences of mathematics learning during their primary years up to the first term of their high school year as they completed their journals daily. To ensure that these learners completed their journals, they were guided through the process of journaling but a few did not adhere to the guidelines provided.

Theoretical Framework

Located within the interpretivist paradigm, this study explored the learners' and teachers' experiences of mathematics in the transition from primary school to secondary school. The study was underpinned by sociological descriptions of forms of participation that emerged through reproduction and evolution of social practices. Constructivist theories underpinned analysis of the emerging data. Two fundamental frameworks were used to understand and theorize the data obtained—situated learning theory and social learning theory.

Situated Learning Theory

Boylan's (2002) 'ecologies of practice', which was born out of Lave and Wenger's 'communities of practice' and adapted from situated learning theories, was used as one of the frameworks that guided this study. This theory is based on sociological descriptions of the different forms of involvement and participation that emerges through diverse reproduction and the changes and evolution of different social practices. The essential features of this framework are based on mutual engagement, joint enterprise and a shared repertoire. The situated perspective makes the assumption that learners function within a social milieu and that learning is not confined to just the classroom. It places emphasis on the practices that the learners engage with instead of simply focusing on the teaching and learning activities. This then redefined the role

of the teacher, from that of the great repository of knowledge to that of an expert in practices. Situated learning theory aids in explaining the lack of knowledge transfer from school to non-school contexts, and recognizes a connection between subject practices and pedagogical practices (providing insight into why different pedagogies not only influence the amount that is learned but also what is learned).

Theory of Practice

The second framework that influenced this research was Noyes' (2002) 'mathematics learning landscape', a metaphoric analogy based on Bourdieu's 'theory of practice'. These categories are listed as firstly, field (a reference to contexts and power relations), secondly habitus (an embodiment of culture and personal history) and finally, capital (economic, social and cultural wealth). Noyes' (2004) theory is further explained using geology, climate, human influence and time. With specific reference to education, geology is a distinct reference to the buildings, the unique architecture and site, as well as the obligatory age of schooling. Climate makes special reference to the social environment. This theory closely correlates to Bourdieu's work that is allied to objective structures, subjective structures (habitus), power relations (field) and time. Noyes (2004) uses the metaphor of a landscape to create an image that supports the analysis of the similarities and differences between two learning locations, in this instance, the primary and secondary schools.

Bourdieu's work offers a way of deriving meaning from the processes through which knowledge is constructed in society. This analytical tool is used to construct an understanding of the culture of education within the South African context and to analyze how the understanding and knowledge of mathematics have come to be accepted as the knowledge by the learners, and to probe the factors, contexts and circumstances (field, habitus and capital) that affect mathematics learning during the transition from primary school to secondary school. Mathematics may also be seen as a socially constructed body of knowledge based on a set of conventions of approach that are located in the cultural domain. The difficulties that many learners encounter with mathematics can be directly related to their contexts, circumstances and the assumptions made in transmission of mathematical knowledge over the different phases of schooling.

Bourdieu's theoretical work can be seen as providing a set of tools, which can be applied, as required and with differing emphasis, to inform empirical observation and interactions. In addition, situated learning theory also informs this research. Both frameworks are context-based and are social learning theories. They both focus on the environment (joint learning enterprise or habitus), as well as the development of identities. These frameworks inform this study by analyzing the different contexts, that is, primary school and high school) of learners' experiences and interactions, the identities they create and the patterns that may emerge.

FINDINGS

There were notable differences in primary school mathematics learning as compared to secondary school mathematics. This ranged from the pace of teaching and learning to the demanding and complex nature of high school mathematics. There were also several factors involved in the transition process that affected mathematics learning.

There are various aspects of the environment that impact the learners and their mathematics learning. The learner is continuously engaged in negotiating his or her identity in order to harmonize the interaction between environments and their expectations. The learner is influenced by three broad categories, namely, schooling and classroom environment, community or family environment, and habitus, field and capital.

DISCUSSION

Communities of Practice Within the Schooling Environment

Both schools could be seen as learning organizations with systems and structures in place to make them appropriately functional. Within any organization there exist multiple communities of practice, each according to their shared domain of interest. So too, within the schooling environment were technical, athletic, aesthetic,

practical and many more communities in addition to the academic communities of practice. Membership of these communities was not exclusive, since members could belong to several different communities simultaneously. Membership of the different communities was one of the finer factors that shaped their identities as learners of a particular organization. However, the mathematics classroom and learning environment as a community of practice was the focus here.

Incorporated within both the primary and the high school (the fields of this study) were very functional practicing mathematics communities. Each of these schools constituted active learners, suitably qualified educators and a library of mathematical resources. From observation, both classrooms in the two different institutions (primary and secondary) were governed by structural authority, disciplinary rules and regulations and bound by an engagement of mathematical procedures and activities. The similarity of both of these contexts (communities) could be a possible reason why the learners should have experienced a relatively smooth transition from the primary school to high school. The students from primary school in this study would generally move to the high school in the study. Somehow the teachers had not forged any relationships to ensure a smooth transition from one school to the other. When interviewing the high school teachers it appeared as if there was not a formal relationship, but rather one that the teachers themselves had established through their own efforts. Two teachers from the high school, Fathima and Natasha, were asked: 'Do you ever meet with teachers in the primary school to discuss curriculum or any other aspects related to your learners and mathematics?' and she responded as follows:

Fathima: *I do on a personal level – I discuss methodology and ways to improve delivery.*
Researcher: *Are there any joint meetings between primary and high school educators?*
Fathima: *I have not been to one.*
Researcher: *Does the Department of Education ever encourage such meetings?*
Fathima: *I do not know.*
Natasha: *No, unfortunately!*
Researcher: *Does the Department of Education ever encourage such meetings?*
Natasha: *No, unfortunately not!*

The impression created by the high school teachers is that they have to create their own opportunities in order to create conducive environments for their learners to transition from the one school to the other. On the other hand, the primary school teachers felt that the high school teachers did not show much interest in forging these relationships. Sidney, the primary school teacher responded as follows:

Sidney: *We have our own clusters* [clusters here would refer to schools grouped together on the basis of their location]. *We have clusters formed by the Department of Education but somehow the high school teachers feel that they don't have to attend the interaction with primary schools.*
Researcher: *So there are structures in place?*
Sidney: *Yes there are but it's not being attended by secondary schools.*
Researcher: *So basically secondary school teachers are not attending these meetings?*
Sidney: *Yes.*
Researcher: *Did you have a meeting for this year?*
Sidney: *Yes, we had the meetings but it's not attended by high school teachers.*

There seems to be a hierarchical mentality that is prevalent in these schools. The primary school teacher indicated that despite the official meetings called, high school teachers did not make any attempt to attend. Anecdotal experiences shared amongst teachers in South Africa show a hierarchical structure in the different schools. High school teachers feel that they are superior whilst the primary school teachers have themselves developed an inferior complex.

There are some other findings that ought to be mentioned.

Learners' Performances in Examinations

The transition from primary to secondary, in this study, found that learners performed much

worse academically in the high school. Table 4 shows the learners' marks in Grade 7 (primary school) and in Grade 8 (high school).

All the learners showed a decline in their marks, with some learners obtaining far lower marks than expected. Nancy, for example, had sixty-five percent for her November examination in Grade 7 but obtained only eight percent in the final examination in Grade 8. This decline in mathematics performance is not unusual and this is corroborated by Attard (2012:54) who states, *"The transition to secondary often results in some level of achievement loss."*

Mark, whose primary school results indicate that he is an above average mathematics learner, achieved consistently mediocre marks throughout his first year of high school. He expressed contentment with his achievement in high school. When interviewed he stated that he *"likes to go with the flow of things."* He preferred to do what his friends did. Even in his journal entries he expressed his boredom in the mathematics classroom as well as his joy of having greater freedom in high school.

It was also important to note that by the end of their first term at high school, none of the learners expressed a desire to *'go back to how things were'* at primary school. This implies that they preferred the high school despite the fact that all the learners found that there was an overwhelmingly increased workload in mathematics. Some found the mathematics period to be too short for the amount of work they were expected to do. There was a distinct change in the pace of work, with more lessons per week, resulting in more homework and classwork. There were also more subjects that they had to concentrate on and inevitably, to some extent, mathematics was sacrificed. One learner indicated that *"in primary school we were given corrections, then we were given more work and we would do more examples but in high school, the teacher will do the corrections and just move on."* This may explain their poor performances in the examinations. Attard (2012:56) also found that *"although the content itself did not present as a challenge, students did find the presentation of the content and the volume of work expected of them was demanding"*.

When probed, another learner indicated that the *"ways and the method that he (primary school teacher) used to teach us was not hard at all and if we did not understand something he would go over the example and explain to us in more detail"* and in high school the *"teacher will help but there is not enough time"*.

It seems that the change in teaching methods and the pace of work may be contributing to their poor performances in high school.

Mathematics Teaching Methods

Paul (2014:205) found that one of the challenges *"experienced by students during transition to high school is failure to adapt to the secondary school curriculum. Transition can be difficult for some students, as they are required to adapt into a new environment and learning styles that is different from what they have learned during their previous years in primary school. Many students experience significant changes in the teaching and learning practices."* The learners in this study expressed the view that the mathematics lessons (in high school) lacked drilling and continuous revision as compared to primary school. This change in strategy has affected the way these learners perform in the classroom. They expect drill and memorizing to continue into the higher grades. One learner indicated that they expect the mathematics to be as *"easy as it was in primary school and they (the learners) don't study hard*

Table 4: Comparison of learners' mathematics marks (as a percentage)

Learners	*Primary School Grade 7*				*High School Grade 8*		
	June	*November*	*March*	*June*	*September*	*November report*	*November exam mark only*
Tina	89	82	63	65	84	72	62
Tammy	62	52	53	36	43	47	43
Sam	62	50	21	24	34	38	43
Mary	85	81	71	68	60	67	50
Nancy	76	65	40	22	48	49	8
Mark	71	69	52	48	51	57	59

enough." Another learner stated that she felt uncomfortable in the high school mathematics classroom because *"I don't really know much about math and sometimes I get bored and sometimes I tend not to listen."* She went on to state that in the *"primary school the teacher used to just randomly pick on us and ask us to do the sums and you must just know it."* This surprise element seemed to have kept them concentrating on the work being done. They had to pay attention continuously or run the risk of being humiliated in front of the entire class. This seemed to have worked for them. In the absence of a similar strategy in the high school, it allowed them to become bored and hence, their attention waned.

One of the learners expressed a view that *"in primary school they (the teachers) explain more in detail and in high school I can't understand most of the work."* This was reiterated by another learner who stated, *"with math now we are much faster. Some of the methods are different."* This would imply that the high school teachers, who perhaps have a larger curriculum to complete and more accountability, would try to go through the materials much quicker. In any event, their methods would have changed from the drill and memorization of concepts and rules.

A common comment from all learners was the fact that the high school class comprised far more learners than they had in their primary school. One learner stated, *"It was different in primary school. There were 22 learners in a class now there are 38. It is kind of stuffy."* Another learner expressed a similar view when he said that *"it is more stuffy in the classroom and the teacher speaks very softly and I sit right at the back and I cannot hear."*

The larger classes impacted the interaction between them and the teacher. They felt that the teacher had less time to actually consider their individual problems. A further complication arose when one learner expressed the fact that she did not want to go to the teacher for assistance because *"I feel that I give him too much problems because lots of other children don't understand as well, so I go to my mother for help."* When probed further, she stated that *"he may get angry or think I am stupid."* The same learner also indicated that she was not afraid of her Grade 6 teacher but *"I only wanted to confide in him alone, not with the class around and when I went to him he explained it to me and if I still did not understand he would explain it to me again."*

Two important points arise out of these statements. The first is that the learner felt constrained to ask for assistance despite the fact that a large number of learners did not understand. There seemed to be a feeling of guilt and a fear of rejection. She also feels sorry for her teacher. Secondly, the learner seeks assistance from her mother. On probing she indicated that her *"mother was a very good math student and sometimes I feel like I betrayed her and I am not living up to her standards."* Again the feeling of guilt but there was no information as to what the qualifications of her mother were. It may be that her mother was not a mathematics graduate and her assistance may not be exactly what the learner needed.

The feeling of guilt was not an isolated occurrence. Another learner indicated that her *"whole family was good mathematical students but my father's side were not very good at math so I fall on my father's side"*. She rationalized that her inadequacies in mathematics were easily explained through her genetic connection with her father.

These are some of the factors that could have influenced their worsening mathematics results.

Learner Self-image

Learners did not portray a positive self-image in mathematics. Five out of the six learners saw themselves as average mathematics learners. One learner stated that he was *"average, I am not perfect at math but I can cope."* Some developed a negative attitude towards their mathematics educators as they felt the educator was not competent enough. The increased tendency to be more negative about mathematics learning, their relationships with teachers, and teaching and learning in general was evident in the latter part of the first term, and not in the first few weeks following the transition. One learner felt that she could not ask questions whilst a few other leaners could ask because *"they are confident. They are not scared to ask."* Another learner expressed the view that in the previous year she *"kept blaming the teacher but maybe it was my fault maybe I was too scared to communicate."*

CONCLUSION

This research showed that in the schools researched, teachers generally do not communi-

cate with each other about the mathematics taught, the types of learners they have and the possible collusion in their work. Teachers from high schools may not necessarily make the effort to meet with the teachers in the primary school. This may explain the decline in learner achievement after the transition. With greater cooperation between the teachers of the primary and high schools, it might make a difference in the way these learners perform in their examinations and tests. Learners also indicated that there is a sudden change in teaching methods, from drill and memorization to those of attempting to attain understanding. Perhaps discussion between these teachers across the primary-secondary divide would be useful in eradicating the sudden change in teaching methods. The move to high school also reveals that the learners develop a poor self-image in terms of mathematics. Whilst it is common for learners to have a poor self-image in mathematics, it seems that the uncoordinated move from primary to high school might in itself contribute to a learner's negative self-image.

LIMITATIONS

This was a very small-scale study and its results cannot be generalized, despite the fact that the findings are similar to other research conducted in a similar area.

REFERENCES

Alex JK, Mammen KJ 2012. A survey of South African Grade 10 learners' geometric thinking levels in terms of the Van Hiele theory. *Anthropologist*, 14(2): 123-129.

Attard C 2012. Transition from primary to secondary school mathematics: students' perceptions. *Southeast Asian Mathematics Education Journal*, 53-60.

Boylan M 2002. *School Classrooms: Communities of Practice or Ecologies of Practices*. Sheffield: Hallam University.

Denzin NK, Lincoln YS. (Eds.) 1994. *Handbook of Qualitative Research*. Thousand Oaks, CA: Sage.

Goodson I, Skyes P 2001. *Life History Research in Educational Settings*. Buckingham: Open University Press.

Howard S, Johnson B 2004. Transition from Primary to Secondary School: Possibilities and Paradoxes. In: *Proceedings AARE 2004 Conference*, Australian Association for Research in Education, 28 November - 2 December 2004, Australia.

Mackay FI 2006. Classroom Factors Supporting Progress in Mathematics. In: *Proceedings of the 30th Conference of the International Group for the Psychology of Mathematics Education* Charles University in Prague, Faculty of Education, Czech Republic, July 16-21, 2006, pp. 105-112.

McCarthy J, Oliphant R 2013. *Mathematics Outcomes in South African Schools: What are the Facts? What Should Be Done?* Johannesburg: Centre for Development and Enterprise.

Neuman W 2000. *Social Research Methods*. 4th Edition. Boston: Ally and Bacon.

New Zealand Ministry of Education 2001. Education statistics of New Zealand for 2000. Wellington: downloaded on the 18 December 2015 From <https://www.educationcounts.govt.nz/_data/assets/pdf_file/0018/7137/2000-Education-Statistics-of-NZ-Booklet.pdf>. (Retrieved on 18 December 2015).

Noyes A 2002. School Transfer and the Learning of Mathematics: Learning Landscapes and Bourdieuan Frameworks. *Paper presented at the 3rd Mathematics Education and Society Conference*, 2-7 April 2002, Helsingor, Denmark.

Noyes A 2004. *A Sociological Study of School Transfer and the Learning of Mathematics*. PhD Thesis, Unpublished. Nottingham: University of Nottingham.

Paul M. 2014. Managing the transition from primary school mathematics to secondary school mathematics: Teachers' and learners' perspectives. *Mediterranean Journal of Social Sciences*, 5(25): 205 - 215.

Saul M 2001. A Distant Mirror: Mathematics Education in South Africa. From<http://www. scienceinafrica. co.za/2001/august/maths> (Retrieved on 14 June 2011).

Taylor N 2011. *Priorities for Addressing South Africa's Education and Training Crisis: A Review Commissioned by the National Planning Commission*. Johannesburg: Jet Education Services.

West P, Sweeting H, Young R 2010. Transition matters: pupils' experiences of the primary–secondary school transition in the West of Scotland and consequences for well being and attainment. *Research Papers in Education*, 25(1): 21-50.

Willing C 2001. *Introducing Qualitative Research in Psychology*. Buckingham: Open University Press.