

Researching for Validity and Value: The Negotiation of Cultural Value Conflicts by Immigrant Teachers in Australia



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Through investigating the professional socialization experiences of two immigrant teachers of mathematics in Australia, this paper reports a preliminary, qualitative study into the nature of value differences encountered, and how these differences were negotiated. Recognizing that cultural differences can – and do – remain current, the two immigrant teachers illustrated how different approaches might be utilized in the process of cultural interactions. Practical implications are discussed, as are issues of research validity.

The Multicultural Classroom: A Focus on Immigrant Teachers

The increasing number of teacher employment agencies to attract offshore / immigrant teachers around the world highlights the casting of wider 'sourcing nets' to fill national teacher shortages. A greater cross-national demographic movement has also led to increasing numbers of immigrant teachers in many countries. Indeed, the notion of the multicultural classroom, often associated with ethnic minority students and teachers, may also incorporate the increasingly visible group of immigrant teachers in school classrooms as well.

Thus, the multicultural, multiethnic fabric of life in Victoria, Australia, is also reflected in the state's teaching force, whose profile has been enriched by immigrant and ethnic minority teachers. Considering the former alone, 5.1% of primary and secondary teachers in state and non-state schools across Australia in 1999 had been teacher-trained overseas (Department of Education Training and Youth Affairs, 2001), nearly all of whom may be classified as immigrant teachers. In Victoria, 6.4% of teachers of mathematics in state, Catholic and independent schools were first-generation immigrants from 28 different countries (Seah & Bishop, 2001). This difference in distribution may be explained (in part) by the trend of immigrants to Australia (especially those arriving from non-English speaking countries) to settle in the states of Victoria and New South Wales. Immigrant teachers in Victoria operate in a context of general teacher shortage in Australia (Auditor General Victoria, 2001; Australian Education Union, 2001), and shortage of teachers of mathematics in particular (Dunn, 2002; Farouque, 2001).

Other than alleviating the state's demand for teachers of mathematics, immigrant teachers — and ethnic minority immigrant teachers in particular — perform several important roles within the school community. Research (Asam & Cooper, 2000; Bascia, 1996; Chinn & Wong, 1992; Su, Goldstein, Suzuki, & Kim, 1997) has highlighted the modelling role of ethnic minority teachers in an increasingly ethnically-diverse student population, with the general belief that a teacher's race, culture and life experiences relate positively to students' intellectual, social, emotional and physical needs. These teachers have also acted as language and academic support providers for immigrant students with limited English proficiency, as well as mediators for their 'native' colleagues.

Education, however, is necessarily a cultural value-laden exercise (Eckermann, 1994; Gudmundsdottir, 1990; Kohlberg, 1981). In fact, "teachers cannot withdraw from showing the values that are important to them. In the cultural policy of the government and the school, teachers are even supposed to stimulate the development of specific values" (Veugelers & Kat, 2000, p. 11). Immigrant teachers, understandably, bring with them to Australia their respective cultural baggage of assumptions, attitudes, beliefs and values. These may be different from the

corresponding dominant assumptions, attitudes, beliefs and values in Australia, even if these teachers had arrived from ethnically-similar cultures such as Britain and New Zealand. In particular, these teachers (like all other teachers) subscribe to certain assumptions, attitudes, beliefs and values with regards to school mathematics as a discipline and to the ways in which it is best taught and learnt, in ways which reflect their respective home cultures' corresponding assumptions, attitudes, beliefs and values. Thus, value differences and conflicts in their respective Australian classroom are inevitable. This paper reports on a preliminary study which examines the nature of such cultural value differences/conflicts experienced by two immigrant teachers of mathematics in the secondary mathematics classrooms in Victoria. It also looks at the approaches adopted by these teachers to cope with and negotiate these value differences/conflicts as part of their respective socialization processes, understanding the teachers' underlying assumptions and how their responsive approaches are manifested in observable ways.

Socio-cultural Aspects of Mathematics and Mathematics Education

The discussion thus far is meaningful to the extent that mathematics and mathematics education are socio-culturally referenced, that values pertaining to the discipline and pedagogy of mathematics are influential and relevant constructs, and that teacher socialization is a significant part of immigrant teachers' professional lives.

The discipline of mathematics is increasingly recognized as socialized knowledge developed as a response to human needs (D'Ambrosio, 1990). One significant driving force for this has been the development of understanding in ethnomathematics over the last twenty years or so. The genesis and development of mathematics in different cultures (Ascher & D'Ambrosio, 1994; Bishop, 1991; Knijnik, 1993) have served the purpose of "encoding, interpreting and organizing the patterns and relationships emerging from the human experience of physical and social phenomena" (Cooke, 1990, p. 5) in each of these cultures. Even what is known as 'western' mathematics has historically witnessed contributions from different cultures such as those of the Arabs, Chinese, Egyptians, Greeks, Indians, and the Western Europeans (Bishop, 1990). At the same time, the discipline of mathematics is also continually being shaped by the society it finds applications in. The agenda and the underlying values of dominant groups such as politicians and research funding agencies influence the rate and direction of development of particular branches of mathematics. Operational research, for instance, was developed out of military applicational needs in the Second World War (Martin, 1997).

Turning our attention to school mathematics, Schmidt, et al. (1997) described the subject as "mathematics as it is conceptualized, represented, structured, and sequenced to share with the next generation through the formal schooling experience" (p. 4). Being socio-culturally interpreted, the same mathematical content can be presented to students in different cultures in different ways, thereby embedded within it the different underlying (cultural) values, beliefs, attitudes and assumptions. For instance, the same manipulatives have been found to be used to achieve different mathematical pedagogical aims in Asian and American classrooms (Brenner, Herman, Ho, & Zimmer, 1999). As Bishop (1994) noted, "all formal mathematics education is a process of cultural interaction, and that every child experiences some degree of cultural conflict in that process" (p. 16).

Values and its Role in Mathematics Education

The reader may have noted the mentioning of values in relation to cultures in the discussion so far. Indeed, culture can be seen as "an organized system of values which are transmitted to its members both formally and informally" (McConatha & Schnell, 1995, p. 81). A common perspective relating values to other related constructs such as beliefs and attitudes has been the former occupying a more internalized position within the human psyche. Krathwohl, Bloom, and

Masia's (1964) second set of 'taxonomy of educational objectives', focussing on the affective domain, perceived values development as an internalization process involving different affective objectives along a multidimensional continuum. The most basic stage, 'receiving (attending)' corresponds to an individual's attention to a phenomenon. Successive stages of 'responding', 'valuing', 'organization', and 'characterization (by value or value complex)' involve increasing levels of internalization, greater levels of internal control over ownership, and increasing complexities and abstraction of these variables. The 'valuing' level is apparently what Raths, Harmin, and Simon (1987) were alluding to when they listed the seven criteria in the valuing process, the satisfaction of all of which they considered necessary for a value indicator (such as beliefs and attitudes) to be transformed into a value. This transformation is also associated with an increasing cognitive involvement and a correspondingly decreasing affective involvement. That valuing is a highly cognitive activity can be seen in Kluckhohn's (1962) reference to values as 'conceptions', in McConatha and Schnell's (1995) linking values to 'constructs', and in Raths, Harmin, and Simon's (1987) perception of valuing as involving the activities of choosing, prizing and acting.

Kluckhohn (1962) considered beliefs to be either true or false, whereas values are either good or bad. From this, it may be able to differentiate values from value indicators in observable ways. For example, whatever we think of the truth or falsity of the belief statement, 'mathematics is fun' (since we cannot possibly say that the statement is good or bad), the fact remains that such a decision can only be made when the statement is made in relation to a subject, in this case, mathematics. Our judgement of the truth of this statement does not affect our judgement of any other thing as necessarily fun. On the other hand, a person subscribing to the value of *fun* will look out for it and/or emphasize it in his/her daily life. It is something considered desirable and good by the person. Thus, values are context-free, while beliefs (and attitudes) tend to be context-dependent. In Rokeach's (1973) words, values are transcendental (across objects and situations).

"A value has a behavioral component in the sense that it is an intervening variable that leads to action when activated" (Rokeach, 1973, p. 7). However, any given situation may trigger more than one value, and thus the relationship between values and subsequent action may be less than directly causal. In any given situation, competing values (similar to Hofstede's (1997) notion of 'conflicting values'), overriding values (see FitzSimons, Bishop, Seah, & Clarkson, 2001), as well as second-hand values (see Tripp, 1993) may be in operation. Rather than considering individual values subscribed to by individuals, then, it may be more useful to think in terms of personal value systems, and in terms of how values are prioritized within such systems.

In the light of the socio-cultural aspect of mathematics and mathematics education, the role of values in mathematics education is a significant one. Indeed, it has been receiving increasing attention in mathematics education research over the last few years (e.g. Bishop, FitzSimons, Seah, & Clarkson, 2001; Brown, 2001; Chin & Lin, 1999b; Lim & Ernest, 1997; Seah, 1999). The research area has been pioneered by Alan Bishop, who defined values related to mathematics education as "the deep affective qualities which education aims to foster through the school subject of mathematics" (Bishop, 1996, p. 19). Indeed, values related to mathematics education are inculcated through the nature of mathematics and through the individual's experience in the socio-cultural environment and in the mathematics classroom. These values form part of the individual's ongoing developing personal value system, which equips him/her with cognitive and affective lenses to shape and modify his/her way of perceiving and interpreting the world, and to guide his/her choice of course of action. They also influence the development of his/her affective constructs related to mathematics education and to life. Bishop (1996) identified three categories of values related to mathematics education, i.e. mathematical, mathematics educational, and general educational. Examples of these would include *rationalism* (a mathematical value), *instrumental understanding* (a mathematics educational value), and *efficiency* (a general educational value). In particular, three pairs of complementary mathematical values were

discussed by Bishop (1988), namely, *rationalism — objectism, progress — control, and openness — mystery*.

Teacher Socialization

Professional socialization is the "process by which neophytes come to acquire, in patterned and selective fashion, the beliefs, attitudes, values, skills, knowledge, and ways of life established in the professional culture" (Su, 1990, cited in Su, Goldstein, Suzuki, & Kim, 1997). Teacher socialization is the process through which a teacher becomes a participating member of the teaching profession (Danziger, 1971). Both the socio-cultural context of mathematics and mathematics education, and the role of cultural values in mathematics education, imply that the ways in which an immigrant teacher negotiates value differences/conflicts in the host culture impact upon the quality of his/her socialization into the local mathematics education community.

Factors accounting for the nature of a teacher's professional socialization extend from the teacher's own life experiences (Zeichner & Gore, 1990), to teacher education courses (Feiman-Nemser & Buchmann, 1986), to the teacher's workplace (Pollard, 1982). Within the workplace, Pollard (1982) discussed teacher socialization in terms of the interactive (classroom), institutional and cultural levels.

In the context of little prior research on immigrant teachers, a look at the socialization experiences of ethnic minority teachers may be insightful. The assumption here is that the ethnic minority communities retain to some degree their own cultural values, which may lead to the encountering of some of the value differences/conflicts experienced by immigrant teachers.

At the interactive level, Asian American student teachers have been reported to encounter value conflicts relating to student respect for teachers (Su et al., 1997), with potential implications for the applicability and effectiveness of different pedagogical strategies across cultures. African American teachers in a study conducted by Madsen and Mabokela (2000) reported value differences/conflicts of cultural perceptions relating to student discipline.

At the institutional level, immigrant and ethnic minority teachers can possibly encounter organizational cultural insensitivity, leading to an experience of "the pervasive power of racial categories in erasing individual variability and complexity" (Madsen & Mabokela, 2000, pp. 858-859). Teachers' experiences of racism have been reported by David (1993) and by Santoro, Reid and Kamler (2001). The modelling and advocacy roles taken up by ethnic minority teachers have led to, as well as reflected, several conflict situations in the workplace of the minority teachers. The relationship between ethnic minority teachers and minority students has been reported to signal ramifications for professional status and organizational access (Bascia, 1996). There were also reports of exclusion from mainstream professional and social formal and informal interactions, conflicts between personal values and beliefs of what is acceptable in the school, which may well lead to teacher engagement with covert subversive actions in the classroom (Bascia, 1996).

A recurring outcome reported in these studies has been the teachers' feeling of professional, social and cultural alienation and isolation (see, for example, Bascia, 1996; Court, 1999; Kamler, Santoro, & Reid, 1998; Madsen & Mabokela, 2000; Meacham, 2000; Overberg, 1976; Santoro et al., 2001). Some of these teachers responded by 'staying within oneself' professionally, or by restricting their interactions to peers of the same ethnicity. Unfortunately, this was often misinterpreted by their 'native' peers as a preference to segregate and exclude themselves from the mainstream, instead of being recognized as a way through which these teachers obtained some form of psychological and/or emotional support.

There are, of course, 'success' stories. One of the teacher participants in Kamler, Reid, and Santoro's (1997) study responded by consciously trying to be Australian, "to 'be' more like the

majority: to be able to take a joke, to forgo old values for new" (p. 21). The two African American teachers in Meacham's (2000) study responded to the phenomena of cultural denial and cultural limbo through the cultivation of a 'language of critique' to validate the role of African American English, and through the refinement of their own value systems to re-orientate their cultural worldviews.

Methodology

As part of a larger study to examine the nature of value differences/conflicts encountered by immigrant teachers, and to investigate these teachers' responsive strategies to the potential dissonance which might result, this preliminary qualitative research study adopts the grounded theory tradition (Glaser & Strauss, 1967) of analysis. Data were collected from each of the two teacher participants, Carla and Manoj (pseudonyms), through three lesson observations, three post-lesson semistructured interviews (Merriam, 1988), and document analyses (teacher questionnaire, and teacher marking of student written work).

A feature of this preliminary study (as compared to other studies with ethnic minority and immigrant teachers) is the collection of data from observing the teacher participants' professional practice. While this data source presented opportunities to explore socialization issues at the interactive level (Pollard, 1982), it also addressed a concern over an individual's ability to identify such internalized and subconscious constructs as values (see Seah, Bishop, FitzSimons, & Clarkson, 2001). "Many values remain unconscious to those who hold them They can only be inferred from the way people act under various circumstances" (Hofstede, 1997, p. 8). Thus, one of the observation foci in the classroom visits was teacher actions in response to decision points; teacher decisions during these incidents reveal prioritized values and underlying assumptions. The lessons were video-recorded so that non-verbal cues might be reviewed. Verbatim transcriptions of the lessons formed the basis of analysis of the observation data.

The interviews not only acted as additional sources of data, but also allowed for clarifications on issues and questions identified in the teacher questionnaire response and during the lessons observed. Unwillingness to talk about such private matters as values is a real problem reported by Chin and Lin (1999a) and Leu (1998). Demonstrating a genuine interest, fostering a more personal (albeit newly developing) relationship, and my positioning myself as a fellow immigrant teacher are three strategies which have helped the teacher participants reported here to share their respective experiences more openly. In addition, the 'discursive probing approach' used by Chin and Lin (1999b) also proved useful in eliciting teacher response at a time when a teacher participant felt more ready to share. The interviews were audio-recorded, and transcripts made for analysis.

The main structure of the self-administered teacher questionnaire was based on a similar questionnaire used in the 'Values And Mathematics Project' conducted jointly by Monash University and the Australian Catholic University in Australia in 1999-2001. The questionnaire used in this study was designed to serve two purposes. Firstly, items were included to collect teacher participants' background information. Secondly, teacher responses to the next 34 items provided indirect data regarding the immigrant teachers' practices, experiences and opinions relating to their mathematics teaching in Australia and in their respective home cultures. These items asked for respondents' degree of agreement to relevant value statements, preference among alternatives, and open-ended reflections on cultural comparisons in mathematics teaching and learning.

Teacher marking of — and comments in — student written work reflect their pedagogical expectations and responses to student input, underlying the teachers' own values relating to mathematics content and pedagogy. "All writing expresses and disguises dispositions, particularly values. Sometimes what a writer writes says more about the writer than about the phenomenon

they write about" (Tripp, 1993, p. 92). Thus, the way a teacher marks student work, the comments he/she includes, provide clues to the teacher participants' response to value differences/conflicts.

The analysis for meaning in the lesson and interview transcripts, and in the documents collected, reflected the fusion of narrative analysis (see Mishler, 1986) with the 'traditional' qualitative data analysis 'method'. "A narrative contains a *temporal* sequence It has a *social* dimension, someone is telling something to someone. And it has a *meaning*, a plot giving the story a point and a unity" (Kvale, 1996, p. 200). Narrative analysis recognizes that human speech and actions need not be temporally-ordered. The use of the 'discursive probing approach' during the interviews also accounted for chunks of information in transcripts which appeared displaced in time. A teacher participant's momentary digression to elaborate on an event discussed before, in the context of shared experience and understanding with the researcher, may appear to be an irrelevant chunk of text during the coding process. Thus, the first step in data analysis had been to arrange all text and transcribed data in temporal order, so as to tie the different parts of each story together.

Reflecting the grounded theory approach of this study, the coding process proceeded along in three passes, involving open coding, axial coding, and selective coding (see Creswell, 1998, p. 57). To explicate the theme of each narrative at the level of what Agar and Hobbs (1982) called 'thematic coherence', the utterances and writings were then re-examined for expressions of each teacher's recurrent values, beliefs, assumptions and goals.

Lastly, each analysis also acknowledged the interpersonal function of text (Halliday, 1973, cited in Mishler, 1986): each teacher participant's story was understood and interpreted in terms of such factors as place/time of interviews, and the quality of the relationship between each teacher participant and the researcher.

Carla, Romanian Immigrant

Background and interaction context

Carla was an engineer before joining the teaching profession in Romania. She migrated to Australia 6 years ago, took up a teacher education course, and has been teaching at the secondary level in the last 5 years. At the time of this study, she had just joined a state secondary college in metropolitan Melbourne a few months before, having taught in country Victoria prior to that. The student population at the secondary college was highly multicultural: the 400 students represented over 50 different countries! According to the prospectus, the school "values the harmonious diversity of cultures within the College", and maintained an overseas student exchange program as well as an active relationship with overseas sister schools. The class observed was a Year 12 Further Mathematics class.

In her previous country school, Carla was regularly reminded by her principal to teach mathematics 'in the Australian way', although he was not able to describe what this teaching 'style' entails. To Carla,

I strongly believe that Mathematics is Mathematics in any culture. I teach Mathematics my own way, with a great passion and commitment to the students I teach.

This was reflected in her questionnaire response, in which she strongly disagreed with the statement that 'depending on the country I am teaching in, my mathematics lessons portray different underlying values or messages to my pupils'.

This belief of Carla's has been continually reinforced by students and their parents:

parents and students have always been very supportive. Students love the fact that they 'can do Maths' following my explanations and instructions.

Parents love the fact that their children become (more) confident in themselves.

Carla was identified by her subject co-ordinator in a school survey as an immigrant teacher of mathematics. She had responded enthusiastically to a personalized invitation to participate in the study. During the initial contacts, when she was teaching in a country Victorian town, she was glad to be able to talk to a fellow immigrant teacher about her professional experiences in Australia. The researcher and Carla communicated face-to-face, by email, and over the telephone several times before data collection officially began. That Carla and the researcher had come from similar pedagogical cultures helped to establish a rapport.

Each interview took place after each of the lessons visited, in a room in Carla's workplace (school). Carla was always eager to relate her stories. The topics of discussion often lingered at the back of her mind in between meetings; there were times when she was doing her chores at home and she would come across a professional episode or a comment, which she made a point to remember to share in the next meeting.

Examples of value differences / conflicts experienced

Nature of knowledge taught

One of the value differences/conflicts experienced by Carla related to the promotion of conceptual or procedural knowledge in the different cultures. Carla felt that with its emphasis on student understanding of mathematical ideas, the mathematics curriculum in Australia promoted conceptual knowledge. On the other hand, in Romania, there had been more of an emphasis on student ability to do mathematics, to acquire procedural knowledge. In a way, this value difference was also reflected in the relative differences in the type of student assessment, and the relative importance Australia and Romania placed on it. A student's performance in examinations in Australia did not generally affect his/her prospect of moving on to the next grade level in school the following year. In Romania, however, a student was expected to demonstrate sufficient knowledge and ability during assessment exercise for eligibility to proceed to the next grade level. As a result, examinations were a relatively more significant event in a Romanian student's school year.

In response to this perceived value difference, Carla's actions reflected her questionnaire response that values in mathematics are independent of cultural context, and that she should thus continue to teach mathematics in her own way. As such, in the midst of demonstrating the relationship between the trigonometric ratios, tangent and sine/cosine, Carla initiated a detailed explanation of an algorithm to solve an equation made up of two algebraic fractions. As she summarized in the post-lesson interview,

you have two fractions, a over b equals c over d . Let's suppose I want to find out this one when I know these ones, alright? The easiest way to go is times this, and divide by that.

In her opinion,

that's the basic thing, you know. But I did go through them, because they need it at some stage.

However,

it's not taught here [in Australia]. It is not taught, how do you work this one if it is not taught? You look in the syllabus, it is not there! This is what I taught them a couple of days ago, you know, a equals bc over d , that's it And they [the students] just like it They said to me, "but nobody has [sic] taught this". I said, "I know, it's not there". And it isn't, you know? I mean, how do you want students to understand half the things when something like that is not taught?

During the researcher's visits to her class, it was noted that Carla regularly paused to ask students what the next step in the solution would be. The step/strategy (e.g. 'make x the subject', 'simplify the algebraic fraction') was then written on the whiteboard, before Carla proceeded with

the solution (utilizing the strategy). Here, Carla was demonstrating once again her valuing of student procedural knowledge involved in solving mathematics questions. The general steps/strategies put on the board thus resembled the steps one expects in recipes. In fact, for the following examples which made use of the same solution strategies, Carla was observed encouraging students by reminding them that the same steps were to be used.

Nature of teacher-posed questions

In a student-centred learning environment, students' prior knowledge is acknowledged. There is a focus on directing student motivation, interest and energy towards the lesson at hand. This was embraced by Carla in her questioning style in Romania, even though students "will put their hands up, and the teacher will say you, or you, or you". In Carla's words,

in Romania, there is talking all the time between the teacher and the class. There is asking questions all the time, because you don't want to give them all the knowledge. You just want to get something from them, so they help themselves.

However, Carla had found it difficult to treat students similarly in Australia, where they did not appear to be conversant in the basic computational skills to begin with. During the lessons visited, the researcher observed that Carla's questions were all directed at the class rather than at any one student. In fact, any student in the class could offer his/her response from his/her seat without asking for Carla's permission to speak (e.g. by raising their hands). Carla was conscious of her questioning style and accepting of the students' responding style, however. The main reason why she had not picked particular students to answer questions in class was

because some students don't feel comfortable to answer questions [in public] So, you know, I didn't want to embarrass anyone.

Interviewer: Normally, would you _

Carla: Yeah, I would, yeah, I would. Sometimes I would. I do [embarrass students] sometimes. I ask a question and they don't know, and I said, what I come to realize is that it doesn't matter whether they have the answer or not, or if the answer is wrong or right, because it's all a learning process If they come with the wrong answer, I tend to say, "doesn't matter, we all make mistakes. So what's the big deal? You know, I mean, you have attempted this".

Interviewer: On what basis would you pick the students to answer questions?

Carla: I tend to ask questions, to ask students who are the quietest, who don't answer questions usually There are some [students] who just want to sit there and I tend to ask the ones who never say anything because I want to know what they know, or if they get the understanding or not.

Thus, even when Carla allowed students to freely answer her questions from their seats, she was making a note of those who remained quiet, so that she would at other times direct questions specifically to these students to help her assess the level of their knowledge and/or understanding. Note again that the purpose of getting students to answer questions was to allow Carla "to know what they know, or if they get the understanding or not", which has an assessing flavour and which reflects the teacher-centred teaching style (as opposed to posing questions to elicit student reasoning or opinions or to extend students' thinking).

Quite clearly, while Carla tried not to puncture students' self-image, she was at the same time on the lookout for students who were not very participative, asking these quieter students to answer her questions, ending up embarrassing them sometimes. In this context, her follow-up explanation to students (that making mistakes is part of the learning process) represented attempts to protect the particular students from feeling/experiencing embarrassment in the presence of their peers. In general, then, Carla's switch to a teacher-centred questioning approach has been made in

view of the realities of the mathematics classroom in Australia.

Manoj, Fijian Immigrant

Background and interaction context

Manoj is ethnically Fiji Indian. He was educated and teacher-trained in Fiji, where he taught before migrating to Australia twenty-seven years ago. At the time of his participating in this study, he was teaching in a state secondary college in metropolitan Melbourne, whose 550 students were mainly from middle-class families, many of which were single-parent households. The class observed was a Year 8 mathematics class.

Manoj's professional worldview was one which stressed *education for life*. To him, educating a student goes beyond preparing him/her for examinations. Thus, Manoj felt that teachers should teach the necessary knowledge and skills which students would find useful in their future lives. In a way, this also reflected his valuing the *applicability* of school subjects, including mathematics. Related to this is also Manoj's subscription to the mathematics educational value of *relevance*: he believed that it is important that students understand the relevance of mathematical knowledge and skills in daily life, even if a student "becomes a bum".

Manoj also stressed the value of (student) *discipline* to learn. This value was related to *motivation*, and he felt that a disciplined student would be able to achieve beyond perceived cognitive or environmental limitations.

Like Carla, Manoj was identified as an immigrant teacher of mathematics by his subject co-ordinator. He accepted a personalized invitation to participate in the study, partly to find out more about the notion of values as they relate to mathematics education, and partly to share his experience in negotiating value differences he had encountered in his Australian mathematics classroom. The researcher met with Manoj for a conversation before the first lesson observation/interview. The interviews were conducted after the lessons in his office. Partly due to the difference in age and professional experience between Manoj and the researcher, there was a sense that he was narrating his twenty-seven-year experience in an advisory capacity. A certain level of shared cultural heritage between Manoj and the researcher's respective home cultures facilitated the mutual scaffolding of common pedagogical and cultural assumptions and values.

Examples of value differences / conflicts experienced

Ways of increasing student competence

A value difference/conflict which recurred in the lessons observed related to a perceived difference in ways of fostering student understanding of mathematical concepts. In Fiji, this was promoted through drills/rote learning, and in Australia, the problem-solving. In Manoj's memory, mathematics teaching and learning in Fiji required students to remember facts and procedures, and to practise applying them repetitively. In Australia, however, he found it difficult to imagine students practising 30 mathematics questions on a daily basis. To Manoj, school mathematics in Australia emphasizes student ability to apply basic mathematical knowledge or concepts to novel mathematical contexts. For a teacher who values *practice*, the problem would be to accept that students might be able to go straight into, and perform in, problem-solving activities without acquiring the necessary basic skills.

In negotiating between these different values, Manoj acknowledged the usefulness both in students acquiring the basic mathematical skills, and in their learning to apply these skills in real-world situations. However, he strongly endorsed the value of *practice* in facilitating student understanding. Also, during the lessons observed, Manoj often explicitly asked his students to

remember the necessary, important points. One example was his frequent reminder to students to remember (not just understand) the order of the coordinates in the ordered pair notation.

At the same time, Manoj's personal value of *relevance* (of school mathematics to daily life) meant that he also agreed with the Australian emphasis of applying mathematical knowledge and skills in life. To him, his professional philosophy that competence in basic skills equips students with the understanding necessary for problem-solving. On the other hand, he perceived the local equivalent to be one of promoting understanding through competence in problem-solving.

Thus, although his school textbook arranged student open-ended investigative activities before exposition of concepts and formulae, Manoj would present these sections in reverse order, a demonstration of his resolving the tension between the roles in facilitating understanding of drills and problem-solving. Also, the drill exercises Manoj presented as class work or homework did not simply involve repetitive skills application either. The questions chosen for his classwork and in the student assignment collected reflected Manoj's systematic presentation of questions in increasing levels of difficulty and increasingly specific question contexts, illustrative of Manoj's 'drills-to-promote-understanding' approach.

Role of the teacher

Another significant value difference/conflict confronting Manoj was related to teacher-centred versus student-centred learning. Manoj had expressed in his questionnaire response that knowledge was imparted only by teachers in the Fijian classroom, whereas education was not as teacher-orientated in Australia.

While Manoj acknowledged the potential pedagogical strength of student-centred teaching and activities, and that students may be taught the necessary skills to learn on their own and with one another, he was not convinced (over the years) that in reality, students were able to engage purposefully on the task at hand:

Interviewer: There's a group of people who believe that students can learn by discussing with one another [in teacher-facilitated group-work activities]. What are your views on this?

Manoj: I have yet to find this happening (chuckled). Look, I know what discussions are all about. You see, when you hold discussions, they get out of hand. That's what I find from my own experience. And you find that somebody would say something from there, and then somebody else say something else from elsewhere, and so on. Nobody is listening. Everybody is just throwing things around. So, I don't know, to me, I want to be focussed, to impart the things that I have to teach. I mean, discussions are all very relevant in other subjects, such as English.

As such, teacher exposition and teacher chalk-and-talk were strong features of the lessons observed. In addition, Manoj frequently emphasized student *attention* to what he was saying, especially when he was explaining key concepts. He might be introducing the Cartesian plane as the juxtaposition of a pair of perpendicular number lines, for example, and he would break into reminders such as the following to focus student attention:

Part of the problem with some of you is that you don't pay attention when I'm explaining something which is basic and relevant. When it is basic, you should understand what we're doing before we go on and start doing the actual work [of applying the basic concepts to problem sums].

However, Manoj acknowledged that he has made some concessions to his personal values in his teaching experience in Australia in this regard:

[here in Australia] I understand that it's not possible for them to do that, to concentrate all the time. And, so, this is why I break the monotony of the subject by what I did [For example] I got them to get up to do questions on the board, so that they are not sitting all the time. Then I give them the last 25 minutes or so to do their tasks.

The emphasis which Manoj placed on teacher-centred learning was also reflected in his conduct of the classwork/homework activities. Thus, while students were working on them in class, he explicitly reminded them to work individually and quietly. Students who had difficulties with answering the questions were reminded to direct their respective queries to Manoj only, and not to their peers. Otherwise,

once they start looking for somebody else, they are causing commotion They come asking you, and then you are not doing your work, you are telling and explaining to him.

Manoj's decision to continue with the teacher-centred teaching style was made after having weighed the options inherent in the two teaching styles. At the same time, he had also made some concessions within his teacher-centred approach (such as giving the students in Australia breaks in between periods of concentration).

Discussion

Nature of value differences/conflicts

Carla and Manoj's experiences provide us with a glimpse into the nature of value differences/conflicts which immigrant teachers may encounter in the mathematics classroom in Australia. Although only four value differences/conflicts were introduced in this paper, it is clear that the context in which these occurred in the two classrooms permeated most, if not all, aspects of teachers' professional lives.

At the intended curriculum level, Carla was aware of differences in the expected student learning outcomes for similar topics in Australia and Romania. In particular, she noticed that student skills in manipulating algebraic fractions was 'not in the syllabus'. As for Manoj, his preference to promote student understanding through drills has resulted in his re-arranging the order in which the school-prescribed textbook presented the activities, expository text and practice questions.

There were also examples of value differences/conflicts affecting facets of the teachers' respective implemented curricula. Carla's perception of a difference in emphasis between conceptual and procedural knowledge, for example, had potential consequences for her lesson presentation to her students in Australia. Similarly, Manoj's emphasis on drills at the beginning of topics led to his regularly reminding students to remember key concepts and conventions. His chalk-and-board teaching style was also attributed to his management of the value difference/conflict related to teacher-centred versus student-centred pedagogical theories. In Australia, this same value difference/conflict had also meant that Carla had to alter the ways in which verbal questions were posed to her students.

At the attained curriculum level, Carla also had to take into account how the relative emphasis on conceptual knowledge (against procedural knowledge) in Australia had affected the different ways mathematics assessment was viewed in both countries. Manoj's decision to emphasize drills first in the early stage of introducing a particular mathematics topic had also affected the ways in which his classwork and homework questions were selected.

Clearly, the value differences/conflicts had also influenced the nature of relationship between Carla/Manoj and their students in Australia. Carla's accommodating to a more teacher-centred teaching strategy in Australia, for example, had meant that her questions posed in class were structured to assess students' attainment/understanding of the relevant skills/concepts, rather than to make use of questions to stimulate student creative or reasoning skills. In another school, Manoj's embrace of teacher-centred pedagogical practices resulted in his regularly reminding students to pay attention "when I'm explaining something which is basic and relevant", and to direct their own queries to him (rather than to their peers).

Responsive strategies as a function of educational context compatibility

The examples shown in the preceding paragraphs are representative of the other observations regarding Carla and Manoj's respective responsive approaches to value differences/conflicts: Carla, who valued mathematics and mathematics education as essentially independent of culture, generally adopted a culture-blind approach as her negotiation strategy against the value differences/conflicts she came across. On the other hand, Manoj held the view that there were aspects in both the Australian and Fijian mathematics education traditions which could be used to reinforce one another, and through the years he believed that he had developed a teaching approach which was different from his teaching style in Fiji, but which was also different from a 'typical' Australian teacher's approach, one which he believed was optimal in facilitating mathematics teaching and learning in Australia.

These responsive strategies may well demonstrate the role played by the more pervasive and internalized overriding values held by Carla and Manoj. For Carla, this was her valuing of mathematics as *culture-free*. In Manoj's case, his valuing of *education for life* may be associated with the value of *flexibility*, so that his approach to value differences/conflicts in his mathematics classroom in Victoria was one of amalgamating the strengths inherent in the two educational systems in accordance to his vision of what a sound and responsible mathematics education should look like. These overriding values correspond to the apex in Krathwohl, Bloom, and Masia's (1964) taxonomy of educational objectives (affective domain). At this 'characterization' level, the individual "responds very consistently to value-laden situations with an interrelated set of values" (Krathwohl et al., 1964, p. 35).

However, Carla's switch from a student-centred questioning style in Romania to a teacher-centred questioning style in Australia was rather uncharacteristic of her overriding and other values regarding mathematics and mathematics education, and in fact represented a 'giving-in' situation on her part. A possible explanation for this un-Carla-like 'phenomenon' pertains to the perception of incompatibility in educational context in the home and Australian cultures. When Carla was confronted with a perceived difference in emphasis between conceptual and procedural knowledge, the encounter took place in the context of her perception that the Romanian and Australian mathematics curricula should be compatible and similar. This was for Carla an assumed constant in the context of which she had to respond to the value difference. Her overriding value that mathematics is *culture-free* meant that Carla chose to continue emphasizing procedural knowledge.

Similarly, Manoj's decision to harness the values associated with both drills and problem-solving teaching activities was made in the context of an assumed constant, i.e. the role of school mathematics in a student's future life. When he had to make a choice between teacher-centred and student-centred teaching, there was another assumed constant in operation, i.e. that students anywhere (in Australia, Fiji, etc) learn best in a teacher-centred learning environment.

However, when Carla came face-to-face with a value conflict concerning her questioning style in class, the context in which teacher questioning styles were operationalized was not similar in Romania and Australia, from Carla's perspective. Carla could sense that the students in the two countries showed differing degree of retaining/applying what have been taught to them before (which perhaps also brought about differences in student motivation and interest). It was in the knowledge that students in Romania were equipped with the necessary basic mathematical skills and were relatively more motivated that she was able to adopt a student-centred teaching approach associated with the value of *personal knowledge construction* in Romania. In the absence of an perceived constant of educational context between Australia and Romania, the application of her overriding value could not be made automatically, and she had to make a conscious decision in response to the value difference she encountered in her Australian classroom. At the same time, this decision was apparently influenced by an additional overriding

value of *individuality*, associated with the belief that effective teaching involves treating students as individuals with individual talents and needs, situated against different socio-cultural backgrounds, and designing teaching strategies to cater to these differences.

The teachers' perception of relative value differences/conflicts — issues of validity

Value differences related to pedagogical activities and to mathematics are understood in a relative context. Thus, we see in this paper that, in Carla's case, the Australian mathematics classroom embraces a relatively teacher-centred approach compared to the Romanian mathematics classroom whereas, in Manoj's case, the Australian mathematics classroom's approach is relatively more student-centred when compared to the Fijian mathematics classroom.

Value differences and conflicts mentioned in this paper were as they were perceived and expressed by the two teacher participants. The extent to which they actually existed in the different cultures — and if they did, the extent to which the differences were as perceived — is not as important as the extent to which these were perceived by Carla and Manoj to exist. Herein is the acknowledgement of the sensitivities which immigrant teachers bring with them to their respective professional socialization processes. It is their cultural lenses through which they have to make sense of the cultural value differences and conflicts they perceive and encounter in their respective transitions to the Australian educational system.

We may question the validity of Manoj's claim that rote learning/drills is an educational value in Fiji. In fact, Manoj was also aware that values could have changed in Fiji over the last twenty-seven years he has been in Australia. But this should not affect the validity of this study because for Manoj, the following two factors have evidently led him to continue to associate the Fijian education system with rote learning/drills nevertheless: his earlier (value-forming) experience in Fiji as a student, and immigrants' perception of a 'cultural standstill' with regards to their respective home cultures. To an immigrant, it was as if the home culture has remained as it was at the time he/she emigrated to the host culture. Similarly, we may also question Manoj's manipulation of textbook content order, in that the validity of the student activity as an investigative exercise was lost as that activity became merely an illustrative exercise. The validity in the study, however, was derived from Manoj's opinion that he was conducting an investigative activity.

The value of conducting this study lies in understanding how immigrant teachers may be empowered with a repertoire of strategies to respond to cultural value conflicts. This skill is pedagogically vital because values underlie the mediating energy operating between these teachers' internal and external realities (see Hall, 1994). Maintaining an optimally balanced relationship between these two realities is crucial for meaningful human existence in general, and a fulfilling professional socialization and effective teaching experiences for immigrant teachers in particular.

Implications for practice

Both Carla and Manoj have gone through fruitful socialization experiences, and have been happily settled in the Australian mathematics education system. Although both of them still encounter value differences/conflicts (which should not be expected to go away in time anyway), these no longer create dissonance to them. Rather, both Carla and Manoj were engaged in interacting (see Bishop, 2002) with these incidents in ways which they feel in control and professionally fulfilling. These teachers' actions illustrated that "rather than seeking resolution of the cultural conflict by eliminating difference, one can imagine instead the possibility of engaging ... in cultural interaction, which will involve an alternating and reciprocating development of conflict and consensus" (Bishop, 2002, p. 198). Not only will a positive socialization experience

raise the overall quality of mathematics teaching and learning, it will also lead to consistent values portrayed by these teachers. "As discerning and insightful observers, students picked up on explicit and implicit messages that were conveyed by their teachers" (Asam & Cooper, 2000, p. 32), and indeed, conflicting value signals portrayed by teachers can lead to student confusion.

Carla and Manoj's experiences revealed the extent to which value differences/conflicts may affect different aspects of teachers' pedagogical intentions, planning, activities and interactions. Importantly, their experiences demonstrated that immigrant teachers could contribute fruitfully and fulfillingly in the Australian mathematics classroom using a range of different strategies to negotiate the inevitable cultural value differences/conflicts, without necessarily forgoing values of their home cultures embedded in teaching practices. In fact, immigrant teachers' cultural pedagogical knowledge has the potential to enrich and further fine-tune existing local pedagogical ideas and practices. This knowledge can be professionally empowering to immigrant teachers, and indeed to any other teacher crossing cultural borders as he/she moves from an inner-city to a countryside school, moves interstate, or moves from a state to an independent school, for examples.

While national/state mathematics curricula identify the culture-specific aims, purposes and roles of school mathematics education, and thus also the 'what' of teaching, the 'how' of teaching and of achieving these targets remain a teacher's craft. There may always exist the question of how best to teach particular topics to particular students in particular cultures, and this may account for the fact that the 'how' dominates the 'what' in mathematics educational research and professional development courses. In some ways, then, the immigrant teachers' professional practice and their experiences in negotiating value differences/conflicts in facilitating an effective mathematics education experience for students may well be enriching lessons for all their colleagues as well.

At the institutional level, the empowerment of immigrant teachers to deal constructively with value differences/conflicts serves as a guard against teacher attrition from the education service. Their continual presence and contribution in the classroom would also be important for the future continual supply of ethnic minority (Su, Goldstein, Suzuki, & Kim, 1997) or immigrant teachers in an educational system which provides for a multicultural Australia.

Manoj had been 'fortunate' in that he had been working with supervisors and peers who appreciated the contribution to professional practice he brought along in his cultural baggage. Carla's experience, however, highlights the potential difficulties associated with peers and supervisors' acceptance and open-mindedness at this level of professional socialization. It is interesting to note that despite regularly urging Carla to teach mathematics 'in the Australian way', her previous principal had not been able to respond to her query as to what constitute(s) this form of teaching. Perhaps, ironically, Carla and Manoj's respective experiences as immigrant teachers will help define an even more effective, 'Australian way' of teaching mathematics in ethnically and culturally diverse classrooms!

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