Constructivist Teaching and Traditional Cultures

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In an earlier paper (Muke, 1998) I described how a community's cultural values can be different from those in the school, and how curriculum reform may help schools overcome their tendency to undermine values considered important in traditional societies. One suggested reform in mathematics education is a change from transmission teaching to constructivist teaching. My experience suggests that this is not a straightforward process. In this paper I wish to examine the chances of being, or becoming, a constructivist teacher when working with students from a traditional culture such as that of the Highlands of Papua New Guinea, or of the Maori or Pacific Island communities in New Zealand.

A Constructivist Approach

Constructivist learning theory is summarised in Biddulph and Carr (in this volume). It recognises that learners actively construct their own ideas rather than simply absorbing or copying them from others. Acceptance of this view implies a change in the teacher's role. It is a change from the traditional view of the teacher trying to convey or transfer knowledge from his/her head into the heads of the children, to one in which the teacher acts as a facilitator of learning. As a facilitator of learning the teacher's role is to provide children with learning experiences involving, for example, collaborative mathematical problem solving in small groups, and opportunities to discuss, explain and justify their solutions (Britt, Irwin, Ellis and Ritchie, 1993). These four Auckland researchers pointed out that the document Mathematics in the New Zealand Curriculum (Ministry of Education, 1992) is constructivist in nature, and that the challenge is to have New Zealand teachers teach in this student-centred way.

An Attempt to Introduce a Constructivist Approach in Papua New Guinea

While I was teaching in community schools (now called primary schools) and high-schools in different locations in the Western Highlands Province of Papua New Guinea, I believed that my mathematics teaching could be effective if I made my teaching student-centred. This is similar to a constructivist view. I knew that if children could actually participate in doing, discussing, arguing, justifying and inventing for themselves during my lessons then they would be more likely to learn effectively. They would understand more and be creative in their thinking in solving other challenging mathematical problems. Therefore, I always prepared my lessons so that I was clearly focussing on the child as an active learner.

However, my lessons hardly ever turned out that way. I felt that I never succeeded in teaching in a constructivist manner. I would end up talking most of the time, doing almost half of the problems for the children and would always be guiding them closely to get them doing problems correctly in the time available. At the end of the lesson, I would have mixed feelings - happy that I had done the tasks that I intended for the lesson, but seriously wondering if the children had learnt anything. They tended to use the skills that I suggested, rather than the ones they understood best. It seemed that the children viewed what I, as teacher, said and...
suggested was the only right way to do mathematics problems, and did not use their own ways that may have made greater sense to them.

I was always concerned about this but I never had time to sit down and think about what could be the likely cause of this problem and identify helping measures.

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One of the reasons was that I was always too busy being involved in lesson preparation, teaching, assessment and various other affairs of my class and the school. It was not until I came to Waikato University in New Zealand in 1997 that I found time to reflect on my past teaching. During my reflection, I began to see that one of the many factors involved was the cultural background of myself and the children that redirected my teaching from child to teacher-centred. I explore this cultural difference below because it may also apply to Maori and Pacific Island children in New Zealand.

A Possible Explanation for the Difficulties I Encountered

I think that my lack of success at being a constructivist teacher in Papua New Guinean schools may be the result of four things, namely:

- a cultural view of knowledge and learning that is different from that assumed in constructivism,
- the power of existing cultural practices,
- difficulties associated with learning in a second language,
- the influence of teacher beliefs.

I discuss each of these in turn by reference to my own culture, the Whagian in the Western Highlands of Papua New Guinea. This is one of approximately 850 cultures in the country.

1. Cultural View of Knowledge and Learning

The formal notion of teaching and learning introduced from the western world into Papua New Guinea sits alongside, and has never displaced, Whagian ideas about the nature of knowledge and learning.

Knowledge in Whagian culture is that required for survival in everyday life, while learning is mostly a process of observing, imitating, recalling, participating and practising in the context of home and community life.

When not at school children use these techniques to learn about gardening, house building, making fences, singing and dancing at ceremonies, attending food exchange and bride-price ceremonies, hunting, telling poems at night, visiting and praying to spirits, keeping records of generations, tribes and land ownership agreements, and some trading.

In all these there is an emphasis on memorisation because the oral tradition is still very strong. It is the means by which both valuable cultural knowledge needed for survival is preserved, and important social and spiritual traditions are kept alive.

There is also an emphasis on real contexts rather than the abstract. Needless to say, the deep experience that children have of memorisation as an integral part of learning in their culture, is not something that they leave at the door as they enter the classroom. On the contrary, they use it as a natural learning process in everything they do.

In contrast, constructivism is largely concerned with the development of understanding. However, Knight (1997) made a strong case for mathematics education research to investigate the link between memory and cognition, something he considered was probably very close.

It may be that children's cultural preference for memorisation as a learning method can be channelled toward developing their understanding.

2. Existing Practices

Related to the point above is the powerful practice of adults such as parents, chiefs, elders and other respected tribal members being regarded as the ones with the valuable knowledge and wisdom gained, of course, from their life experiences. Children learn that...

"...there is the possibility that constructivism could take root in mathematics classrooms through co-operative group work..."
Constructivism may help teachers begin to see that memorisation associated with mathematics should also be meaningful.

**What is needed is indepth research that takes account of present cultural values, beliefs and practices, and tries to find a feasible way forward.**

**Conclusion**

It is clear that if Whagian children are to succeed in mathematics then changes in teaching are needed. Despite my initial lack of success, I believe that constructivism may have something to contribute in this respect. The difficulty is that existing beliefs, practices and values form a powerful web of cultural connections into which constructivism cannot easily be introduced. Constructivism requires a change from traditional teaching approaches, but to expect teachers to make a big change in their teaching in a short time is unrealistic. What is needed is indepth research that takes account of present cultural values, beliefs and practices, and tries to find a feasible way forward. Perhaps such research could begin by investigating, in an action-research way, the potential of co-operative group work to enhance the children’s mathematics learning. It may also be worthwhile to identify the mathematics that exists in everyday Whagian culture as this could provide an authentic ‘bridge’ between the traditional and a constructivist approach. It is possible that much mathematics exists within and can be developed from familiar community contexts, and that much can be learnt, at least initially, from reflecting on meaningful hands-on experiences, as Kinavai and Biddulph (1998) suggest.

These suggestions may also be relevant for the mathematics education of Maori and Pacific Islands children in New Zealand. As Clark (1998) noted, Maori and Pacific Islands students' performance in mathematics tends to be much lower than that of their pakeha counterparts. Behaviours which she thinks may contribute to this are cultural in nature, namely a reluctance to speak in class, a hesitancy to approach teachers, and a tendency to sit near the back of the room. These behaviours demonstrate respect for authority, including not speaking unless specifically questioned. They are very similar to the way children learn to behave in the Whagian culture.

**References**


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