AN ETHNOMATHEMATICAL STUDY OF TRIAXIAL WEAVE IN MALAY FOOD COVER WEAVING

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ABSTRACT

Ethnomathematics is a research discipline that explores the connection between culture and mathematics. This on-going research investigates the ethnomathematics in Malay food cover weaving. The food cover is cone-shaped in appearance and built using a weaving technique called hexagonal or triaxial weave. To build the framework, five strands are plaited together in three directions to form the peak of the cone. Adding five strands at each level in a circular motion enlarges the structure, and the process is continued until the required size is achieved. A finished framework has a pentagonal hole at the top that is surrounded by hexagonal holes all around. Coloured strands are then interwoven between these holes to form a variety of patterns.

The theoretical basis of this research is Alangui's (2008) model of 'mutual interrogation'. He proposes this model as a way of resolving the issue of equality between the knowledge of practitioners and the knowledge of mathematicians. The methodology involves creating a dialogue between the concepts of the practitioners and the mathematical conventions of the mathematicians with the aim of fostering mutual understanding and insights.

In this study, a 'dialogue' between food cover weavers and mathematicians has been created for two out of three planned cycles of fieldwork. The researcher's role is to facilitate the exchange of ideas between these experts in their respective fields in order to understand and mathematically formalise weaving limitations and possibilities. Ethnographic techniques via participant observation, field notes, audio and video recordings are being used to gather information.

In Cycle One, the weavers' constructive concepts and the mathematicians' perspectives on the weaving structure and patterns were identified. Discussions include variations in construction, pattern classification and pentagonal-hexagonal connections (5-6 connections) in pattern formation. A computer-generated weaving template was created to mediate investigation.

Based on the feedbacks received from the weavers, several issues that were raised by the mathematicians in Cycle One were resolved in Cycle Two. Some limitations of the template were discovered, especially in highlighting the 5-6 connections. This talk discusses a different approach that is taken up to correct the limitations of the original weaving template. The power of the template to generate new questions for mathematicians and weavers is demonstrated.

Alangui, W. (2008). *Mutual Interrogation as an Ethnomathematical Approach.* The University of Auckland.