Research Article

Designing Digital Solutions for Preserving Penan Sign Language: A Reflective Study

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Oroo' is a language of nomadic Penans in the rainforests of Borneo and the only way of asynchronous communication between nomadic groups in the forest journey. Like many other indigenous languages, the Oroo' language is also facing imminent extinction. In this paper, we present the research process and reflections of a multidisciplinary community-based research project on digitalizing and preserving the Oroo' sign language. As a methodology for project activities, we are employing Participatory Action Research in Software Development Methodology Augmentation (PRISMA). Preliminary results show a general interest in digital contents and a positive impact of the project activities. In this paper, we present scenario of a research project that is retooled to fit the need of communities, informing language revitalization efforts and assisting with the evolution of community-based research design.

1. Introduction

Indigenous peoples have the right to revitalize, use, develop and transmit to future generations their histories, languages, oral traditions, philosophies, writing systems and literatures, and to designate and retain their own names for communities, places and persons. (United Nations Draft Declaration of the Rights of Indigenous Peoples, 1993)

There are estimated 40 percent of languages that are endangered. A language is in danger when its speakers no longer pass it on to the next generation. Languages are far more threatened than birds (11% threatened, endangered, or extinct), mammals (18%), fish (5%), or plants (8%). According to Ethnologue, 84% of the 46 living languages in Sarawak have less than 10,000 speakers [1]. Besides spoken and written languages much less documented and well-known are the sign and secret languages of rainforest inhabitants, which are made out of combinations of twigs, leaves, and other jungle products. Penans' sign language Oroo' is one of the examples. Oroo' is an extremely sophisticated asynchronous signage language of the nomadic Penans in the rainforests of Malaysian Borneo. The Oroo' signs are made out of rainforest materials, such as twigs, branches, and leaves, and attached to the signage stick. Through different combinations of signs, various messages and narratives are constructed, such as call for help, warnings of danger (snakes, old branches, and enemies), instructions (meeting points and times), and information about whereabouts of food, animals, humans, and houses.

According to Moseley, "*The loss of indigenous languages is also detrimental to biodiversity, as traditional knowledge of nature and the universe, spiritual beliefs and cultural values expressed in indigenous languages provide time-tested mechanisms for the sustainable use of natural resources and management of ecosystems, which have become more critical with the emergence of urgent new challenges posed by climate change*" [2]. Oroo' is a living cultural heritage of the Penan which, from a historical, political, social, and scientific perspective, is of extreme value to our society. It is a unique example of convergent relationship between cultural diversity, language, and biodiversity of Borneo. There is thus a need to document, preserve, and sustain this language. However, literature referring to Oroo' is extremely sparse.

In 2014, the Institute of Social Informatics and Technological Innovations (ISITI), Universiti Malaysia Sarawak (UNIMAS), and Long Lamai community with the support