

A Survey on Teachers' Attitudes Towards Bilingual Education (Thai-Tai Yai based) for Border Schools in Mae Hong Son, Thailand

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Abstract

This paper aimed to carry out a preliminary survey on teachers' attitudes towards bilingual education (Thai-Tai Yai based) for local schools in border areas of Pang Mu areas, Mueang district of Mae Hong Son Province of Thailand, to reveal 1) the feasibility and requirements of implementing MTB program(s) in border schools; 2) the nature and implementation of MTB materials; and 3) the nature and implementation of MTB curricula. The research population was 109 teachers from 18 educational institutions. The research instruments were 1) a survey form about language and language use in schools and 2) a questionnaire consisting of five sections: basic information of the respondents; opinions on the management of bilingual education; cost and need for creating primary bilingual media, bilingual courses; and suggestions, respectively. Data were analyzed quantitatively and qualitatively by using frequency, percentage, summation, and arithmetic mean. The results were that (1) the teachers were not ready for any form and aspect of teaching instructions—having few costs and making few demands for building and creating media for bilingual instructions in five related issues as follows: solid foundational media; primary media for listening-speaking Thai; preparation for reading-writing the Thai language; development of reading-writing skills in Tai Yai language with Thai characters; and enhancement of reading-writing skills with reading materials in Tai Yai language; (2) the teachers have few costs and needs for creating a bilingual model course in their schools on eight bases, namely: educational standards; Thai/Tai Yai languages; Thai/Tai Yai cultures; local needs conformity; basic language skills; multicultural understanding, Tai Yai cultural conservation; and teaching plans in bi/multilingual education, and; (3) the teachers lack knowledge, understanding of bi/multilingualism principles, and experiences. Conclusively, bilingual (Thai-Tai Yai) education was not a ready requirement for schools in Mae Hong Son border areas.

Keywords: Attitudes, Survey, Bilingual, Education, Border school

Introduction

According to the World Bank's (2004) report, more than half of the world's school children are living in many communities where their native languages are not accepted in schools. So, their desired learning is not achieved nor does not meet national educational standards—resulting in higher rates of dropouts or repetition. This is a huge problem in education for all that oppose UNESCO's (2005a) goals agreed to fulfil the children's needs of every community in all ethnic groups with full access to free and quality basic education.

Like other countries in Asia-Pacific regions, such as the Lao People's Democratic Republic (PDR), Thailand is an area of ethnic diversity—over 72 languages and cultures were found there with 35-45% of the population (Chaze & e, 1999 in Kosonen, 2005) speaking a mother tongue or ethnic language. Similarly, in the People's Republic of China, over 100 million people belong to numerous ethnic groups, but the standard Chinese as the national or official language is superior to children's ethnic languages—freezing children's literacy achievement in education and creating unequal opportunities in society. In schools, language inequality occurs when the medium of instruction is not children's home language (L1), but rather their standard Chinese (L2)—making the difference between poverty and wealth, living with dignity and living without dignity in society. As a result, those who do not speak or use larger languages as the medium of instruction in schools lose opportunities for good communication, language learning, and other school subject learning (UNESCO, 2005b).

In Thailand, fundamental education starts from the age of three in Pre-Kindergarten to Kindergarten three (early childhood) and compulsory education starts from the age of seven to the age of 12 which is primary education and continues for another six years until they are 18 in secondary school. Therefore, children are forced to meet the standard Thai as a medium of teaching for many years. Consequently, their L1 is confined to narrower domains of use until it is abandoned or else they do not receive appreciation or attention from teachers. Being forced to understand standard Thai from a younger age is a reason for them to have low learning achievement in the Thai language and other courses through which the teacher uses the standard Thai language as a teaching medium.

A report on an analysis of the provincial budget allocation for the year 2019 by the Provincial Budget Bureau revealed that Mae Hong Son (MHS) province has chronic poverty problems among its population of 279,088 people. In 2020, household incomes were low, with an average of 63,419 baht/year/person by the criteria for the management of basic necessity data collection (Open Government Data of Thailand: OGD). Poverty is not only based on household incomes, but also on six dimensions: education, livelihood, work, welfare, life and property safety, and health. According to this, MHS had a low mean of poverty in all dimensions (Chiang Mai News, 2019). In the education dimension specifically, there were some facts about MHS's poor education quality as follows: a) from and out of all 77 provinces across Thailand a study revealed that the average number of years of schooling among the population aged 15 years and over was the lowest level of the quality education by 5.81 years in 2016, b) an access rate to higher education than the primary level (secondary and vocational education) was the 68th (64.9%) in 2015, c) the average intelligence quotient (IQ) of primary school students in 2016 was the 61st (94.6 points), d) the O-Net average result at high school level in 2016 was ranked at 67th (31.54%) (Office of the National Economic and Social Development Board, 2019), and e) MHS Provincial Education Area, Regions 1 and 2, had an O-Net average score of 33.36 in four core subjects—Thai (43.52), English (28.04), Math (28.81), and Science (33.07) from O-Net score evaluation results in the academic years 2017-2019 (Ministry of Education, 2020).

The education quality alone suffices to reflect human achievement from the Human Achievement Index (HAI) 2017. MHS is considered being at the least progress in human achievement with an index of HAI = 0.4637 (lowest) in the 77th province of Thailand. Thus, it is reasonable for MHS to speed up the development of the education quality among children as rapidly as possible.

Mother tongue-based (MTB) - bilingual education (BLE):

MTB-BLE is the use of two distinct languages as a medium in the classroom where the first language (L1: mother tongue) is the language of the family or the language of the community. Tai Yai (Shan) for example is a learning base of other languages, society, and the world through various activities to develop at least four basic language skills and to link them to official languages such as standard Thai (L2: central Thai). MTB-BLE provides better education and the understanding of children's language and culture to learn new things suitable for them around. MTB-BLE as well honours the language and culture of ethnic people by maintaining their linguistic and cultural values and improving their children's education. MTB-BLE is a teaching approach to solving educational disparities and improving Thai literacy and English skills of ethnic school children especially in remote, rural and border areas with the use of L1 as the basis principally in all activities to practice reading, writing and thinking skills and to use L2 and other languages as an additional subject. Children however can expose to L2 more and more as they need—not having to abandon L1. In the long run, the children with L2 skills based on L1 will become bilingual learners with a high level of proficiency (Cummins, 2001; Thomas & Collier, 2003) and achievement in other subjects and additional languages as well (Baker, 2001). Although the term “bilingual learner (BLL)” has broad meanings, here it simply means the learner who uses L1 with family and learns L2 at school.

MTB-BLE involves several programs such as 1) L2 adaptation where L2 is readily adapted to L1 of the learners as much as possible as a medium of instruction, such as Tok Pisin language in Papua New Guinea (PNG) (Siegel, 1997); 2) L2 plays as the medium of instruction in school curriculum while L1 as one school subject such as Hmong and Song in Vietnam (UNICEF's Next Generation Viet Nam, 2013) and Balinese, Javanese, and Sundanese in Indonesia (Maryanto, 2008), and 3) only L1 for a few years earlier in the school system and then adopting L2 as the language of instruction.

The advantages of MTB-BLE are several: 1) reducing dropouts; 2) reducing repetitions; 3) stimulating and encouraging bilinguals to learn more; 4) encouraging parents and the community to participate in the educational system; and 5) effectively cutting costs (World Bank, 2004). MTB-BLE also promotes bilinguals' appreciation of L1 and identity. In the long term, it helps the bilingual to have a full range of knowledge and bilingual competency, to hold the value of backgrounds, to earn self-esteem, to gain greater self-confidence, and to achieve high aspirations in life and education (Baker, 2001; Benson, 2002a).

The main objective of MTB-BLE is that learners succeed in learning and gaining confidence by maintaining the language and culture of their speech community at the same time. So, MTB-BLE is anticipated as one suitable pilot program to improve the quality of school education in MHS, of which areas are bordered by Thai-Myanmar territories.

Backgrounds:

Pang Mu here refers to Pang Mu sub-district area of Mueang District of Mae Hong Son Province, Thailand that covers 13 villages, namely: Pang Mu (PM: Area 1), Kung Mai Sak (KS: Area 2), Tung Kong Mu (TM: Area 3), Nai Soi (NS: Area 4), Ban Mai (BM: Area 5), Sop Pong (SP: Area 6), Sop Soi (SS: Area 7), Mai Ngae (MN: Area 8), Mai Sape (MS: Area 9), Phakholo (PK: Area 10), Khun Klang (KK: Area 11), Shan Mueang (SM: Area 12), and Doi Saeng (DS: Area 13). The area may be classified into three geographical types as

follows: the plain type which includes PM, KMS, TM, MN and SM; the hill type which include NS, BM, SP, SS, PK and KK; and the mountain type which include MS and DS as shown in Table 1.

Table 1 Area characteristics of 13 villages in Pang Mu Subdistrict

| Village | Geography | | | Mother tongue |
|---------|-----------|------|----------|--|
| | plain | hill | mountain | |
| PM | ✓ | | | Tai Yai |
| KS | ✓ | | | Tai Yai |
| TM | ✓ | | | Tai Yai |
| NS | | ✓ | | Tai Yai, Kayah, Kayan, Kayaw |
| BM | ✓ | | | Tai Yai, Pa-O |
| SP | | ✓ | | Tai Yai |
| SS | | ✓ | | Tai Yai |
| MN | ✓ | | | Tai Yai |
| MS | | | ✓ | Kayah |
| PK | | ✓ | | Sgaw |
| KK | ✓ | | | Tai Yai |
| SM | ✓ | | | Tai Yai, Sgaw, Khammueang, Yunnan Chinese, Kayah, Pa-O |
| DS | | | ✓ | Kayah |

Source: Pang Mu Administrative Organization (2020); Office of Mae Hong Son Culture (2021)

From an ethnolinguistic perspective, people from these villages can speak and understand at least two languages (bilingual)—those from the plain villages mainly have a good command of Tai Yai, and non-Tai Yai such as Sgaw; those from the hill villages do either; and those from the mountain villages are commonly good at speaking non-Tai Yai which are Kayah and Sgaw. However, most of them are capable of understanding both Tai Yai and Central Thai to some extent. Some other ethnic minority groups which can also be found within the area are Lisu of part of KS; Kayah, Kayan, and Kayaw of part of NS; Pa-O of part of BM; Yunnan Chinese, Yuan, Pa-O, and Kayah of part of SM that it seems to be the most multilingual village of all.

Pang Mu area is bordered to the north by Mok Champae and Huai Pa sub-district, to the south by Pha Bong sub-district, to the east by Huai Puling sub-district, and the west by Myanmar. So, the schools in Pang Mu area are inevitably considered border schools.

With the exception of the following villages—MN, SM, PK, and KK—the majority of the local villages have community schools that offer primary education to the local youth. As a result, a sizable portion of community school pupils come from the neighborhood where they reside. Although there is no proof as to where the children from these villages attend school, it is likely that some MN students attend Tha Pong Daeng School in the Pha Bong subdistrict, some SM and PK students attend the nearby BM School, and some KK students attend the close-by SP School.

The Municipal Primary School (colloquially as Rongrian Thetsaban Mueang Mae Hong Son), Provincial Administrative School (colloquially as Rongrian Ban Chong Kham), Bannawitaya School, and Hong Son Primary School are among the larger schools that other children from wealthier families are more likely to attend.

As these children belong to various ethnic minority groups whose languages and cultures are not the same, for example; Sgaw (ꨀꨂꨃꨆ or ꨀꨂꨃꨆꨀꨂꨃꨆ in Thai: กะเหรี่ยงสะกอ), Tai Yai (တႆးယႃ, in Thai: ไทใหญ่), Kayah (Thai: กะเหรี่ยงคะยา), Lisu (Thai: ลีซู or ลีซอ), and Lahu (Thai: ล่าหู่ or มุเซอ), they speak different languages and practice different cultures from their homes and communities. To one point, they do not speak the same language as their teachers are using in

classrooms, and they do not practice the same culture as their teachers are doing in the classrooms. These consequently result in low quality of education as mentioned earlier.

To facilitate integration within Pang Mu context particularly, MTB bilingual education is advised for supplementary courses like Local Language and Culture or required courses like Local History and Local Studies in L1, whereas modern subjects like Sciences and Math in L2 or in both languages where possible because specialized subjects and language subjects are inextricably linked—learners cannot develop academic skills and knowledge without having language skills they need in language activities. The same holds true for pupils' ability to develop their academic language abilities without being familiar with academic material (Cambridge Assessment International Education, 2017).

As many large schools in major cities like Krung Thep Maha Nakhon and Chiang Mai offer—Thai instruction as L1 in a specific course like Thai Language only; and English of instruction as L2 in most remaining subjects—this study has not yet attempted to survey which type of MTB program was most appropriate or to immediately launch any of MTB programs. Instead, this study conducted a preliminary survey on three different topics: the possibility of using MTB programs to improve the quality of education in border area schools; the type and implementation of MTB media; and the nature and implementation of MTB curricula.

Objectives:

The objective of this study is mainly to survey teachers' attitudes towards 1) the feasibility and requirements of implementing MTB program(s) in border schools; 2) the nature and implementation of MTB materials; and 3) the nature and implementation of MTB curricula.

Methodology

The research methodologies were as follows;

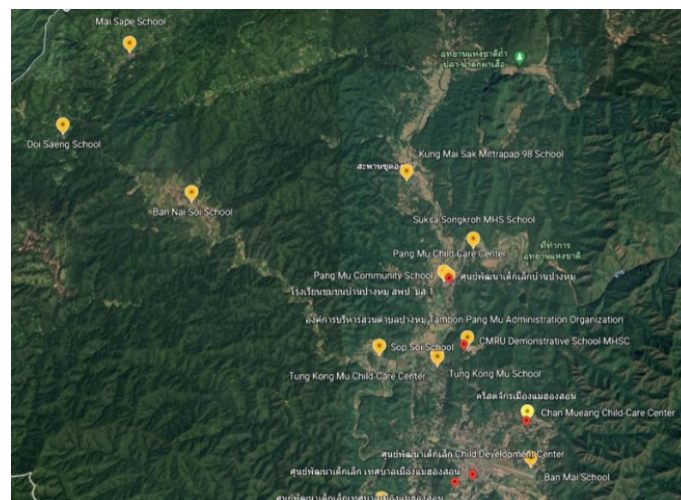


Figure 1 Map of school locations
(Source: Panyawuthakrai, 2022)

This study focused Pang Mu sub-district area of Mueang District of Mae Hong Son Province, Thailand where Mae Hong Son Campus of Chiang Mai Rajabhat University (CMRU) is located. The population was 109 community school teachers who were working (at the time this study was being done) in five different types of 18 educational institutions: 1) eight

community schools affiliated with Mae Hong Son Primary Educational Service Area (PESA) 1 are Pang Mu Community School, Kung Mai Sak Mittrapap 98 School, Tung Kong Mu School, Nai Soi School, Ban Mai School, Sop Pong School, Sop Soi School, and Mai Sape School; 2) a learning centre affiliated with Border Patrol Police Area (BPPA) 336 of Doi Saeng; 3) a special school affiliated with Bureau of Special Education Administration (BSEA) is named Sueksa Songkhro Mae Hong Son School; 4) a demonstrative school affiliated with Mae Hong Son College (MHSC), Chiang Mai Rajabhat University (CMRU) is called CMRU Demonstrative (DM) School, Mae Hong Son Campus; and 5) seven community child-care centres affiliated with Pang Mu Administrative Organization (2020) are from the following communities—PM, KM, NS, TK, DS, MS, and SM. These teachers were chosen for three reasons: first, they were responsible for early childhood and/or primary education, which is a priority of MTB programs; second, their schools are in close proximity to MHSC of CMRU; and third, they had never been involved in any MTB education research previously.

Table 2 Research target border schools

| | | | |
|---|-------------------------------------|--|-------------------------------------|
| Schools affiliated with MHS PESA | | Special school affiliated with BSEA | |
| 1 | Pang Mu Community School | 10 | Sueksa Songkhro Mae Hong Son School |
| 2 | Kung Mai Sak Mittrapap 98 School | Demonstrative school affiliated with MHSC | |
| 3 | Thung Kong Mu School | 11 | CMRU Demonstrative School |
| 4 | Nai Soi School | Child-care centers affiliated with PMAO | |
| 5 | Ban Mai School | 12 | Pang Mu Child-Care Center |
| 6 | Sop Pong School | 13 | Kung Mai Sak Child-Care Center |
| 7 | Sop Soi School | 14 | Nai Soi Child-Care Center |
| 8 | Mai Sape School | 15 | Thung Kong Mu Child-Care Center |
| Learning center affiliated with BPPA | | 16 | Doi Saeng Child-Care Center |
| 9 | Ban Doi Saeng School (colloquially) | 17 | Mai Sape Child-Care Center |
| | | 18 | Chan Mueang Child-Care Center |

Background information about language and language use in schools was gathered and studied from a survey form developed from *Planing mother tongue-based education programs in minority language communities* (Malone, 2010) and revised by an expert from the Resource Center for Revitalization and Maintenance of Languages and Cultures, the Research Institute for Languages and Cultures of Asia, Mahidol University. So, the survey form featured 11 questions— 9 yes-no questions e.g. ‘Are there many students speaking the Tai Yai language?’ plus 2 open questions e.g. ‘In what class(es)/school subject(s) of lower (or upper) elementary levels do the teachers speak Tai Yai?’. However, when ‘yes’ answers arose, some more questions e.g. ‘How many/About how many?’ or ‘How often?’ were added and an estimated number was filled in.

Issues concerning basic personal information, opinions about MTB education, costs and needs for MTB media, the creation of an MTB curriculum, and suggestions for the improvement of quality education in border area schools were examined and analyzed from a questionnaire. The questionnaire was created and adapted from relevant studies: 1) *a development model for bilingual communication abilities at the elementary level of the three southern border provinces’ students* (Kannaowakun et.al., 2010) regarding the opinion about MTB education; 2) *the development of Thai language teaching policy in southern border provinces* (Office of the Education Council, Ministry of Education, 2007) and the other one on *local Thai (languages) medium instructions: a case of bilingual education (Thai-Malay) in four schools of southern border provinces* (Premsrirat et al., 2007). It featured 87 items in total. Except for the first and last issues, each item was designated by a Likert’s five-point satisfaction scale in ascending order— 1, strongly disagree; 2, disagree; 3, neither agree nor disagree; 4, agree; and 5, strongly agree.

To make these questionnaire items qualified, two measures were implemented: a) content validity or Rovinelli and Hambleton's Index of Item-Objective Congruence (IOC), which was performed by three experts' judgements—two from Mahidol University and one from Yala Rajabhat University—and b) reliability, as measured by the Cronbach's alpha coefficient for items' internal consistency in IBM SPSS 26 Version from 20 teacher samples.

As illustrated in Table 3, there could be four expected outcomes for the IOC based on the three average judge scores for each item. Any item examined at a lower level than the IOC average of 0.5 would be removed, nevertheless. Table 4 displays Cronbach's alpha internal consistency and reliability levels. Table 5 shows the validity statistics for seven items on the questionnaire part 1 and Table 6 presents the validity and reliability statistics for 80 items on the questionnaire parts 2-4.

Table 3 Four expected outcomes of three average judges' ratings

| No. | Item | Scale | IOC 1 | | | IOC 2 | | | IOC 3 | | | IOC |
|-----|----------------|---------------------------------------|-------|---|----|-------|---|----|-------|---|----|------|
| | | | 1 | 0 | -1 | 1 | 0 | -1 | 1 | 0 | -1 | |
| 1 | X ₁ | 1, strongly disagree; 2, disagree; 3, | 0 | | | 0 | | | 0 | | | 0 |
| 2 | X ₂ | neither agree nor disagree; 4, agree; | 1 | | | 0 | | | 0 | | | 0.33 |
| 3 | X ₃ | and 5, strongly agree | 1 | | | 1 | | | 0 | | | 0.67 |
| 4 | X ₄ | | 1 | | | 1 | | | 1 | | | 1.00 |

Table 4 Cronbach's alpha and internal consistency

| Cronbach's alpha | Internal consistency | Reliability |
|-------------------------|----------------------|-----------------------|
| $\alpha \geq 0.9$ | excellent | perfectly reliable |
| $0.9 > \alpha \geq 0.8$ | good | highly reliable |
| $0.8 > \alpha \geq 0.7$ | acceptable | reasonably reliable |
| $0.7 > \alpha \geq 0.6$ | questionable | not terribly reliable |
| $0.6 > \alpha \geq 0.5$ | poor | not entirely reliable |
| $0.5 > \alpha$ | unacceptable | unreliable |

Table 5 Validity statistics of items on the questionnaire part 1

| Items | Validity (IOC) |
|--------------------------------------|----------------|
| 1) Basic personal information | |
| sex | 1.00 |
| age | 1.00 |
| position | 0.67 |
| education | 1.00 |
| work experience | 1.00 |
| affiliation | 0.67 |
| Tai Yai ethnicity | 1.00 |

Table 6 Validity and reliability statistics of items on the questionnaire parts 2-4

| Items | Validity (IOC) | Reliability (α) |
|---|----------------|--------------------------|
| 2) Opinions on and needs for MTB education (Tai Yai based) | | |
| <i>Tai Yai based MTB education</i> | | |
| I agree. | 1.00 | 0.989 |
| I find it fit. | 1.00 | 0.989 |
| I find it beneficial to students. | 1.00 | 0.989 |
| I find it beneficial to school. | 1.00 | 0.990 |
| I find it beneficial in the locality. | 1.00 | 0.990 |
| I need it. | 1.00 | 0.989 |
| <i>Tai Yai based MTB education pattern</i> | | |
| As a compulsory subject | 1.00 | 0.989 |

Table 6 Validity and reliability statistics of items on the questionnaire parts 2-4 (cont.)

| Items | Validity (IOC) | Reliability (α) |
|--|----------------|--------------------------|
| As a supplementary subject | 1.00 | 0.989 |
| As an extra curricular activity | 1.00 | 0.989 |
| Tai Yai and Thai spoken in all subjects | 1.00 | 0.989 |
| <i>Preparedness to implement Tai Yai based MTB education</i> | | |
| School administrators are eager to support the adjudgement of the school curriculum. | 0.67 | 0.989 |
| School administrators are eager to advocate school teachers for it. | 0.67 | 0.989 |
| School administrators are eager to allocate a partly budget for it. | 0.67 | 0.989 |
| I can speak Tai Yai. | 0.67 | 0.990 |
| I can spare my time for MTB education trainings. | 0.67 | 0.989 |
| I am pleased to assess MTB teaching outcomes. | 0.67 | 0.989 |
| Most/almost students speak Tai Yai. | 0.67 | 0.989 |
| They like MTB teaching. | 0.67 | 0.989 |
| They are ready for MTB learning assessment. | 0.67 | 0.989 |
| There is an MTB curriculum draft. | 0.67 | 0.989 |
| An MTB curriculum is in use. | 0.67 | 0.989 |
| There are MTB teaching plans. | 0.67 | 0.989 |
| The MTB curriculum has been improved. | 0.67 | 0.989 |
| MTB media and materials are adequate. | 0.67 | 0.989 |
| MTB media and materials are durable and of good quality. | 0.67 | 0.989 |
| MTB medial and materials support the Tai Yai language, cultures, and wisdom uses. | 0.67 | 0.989 |
| Student guardians support the use of Tai Yai in school. | 0.67 | 0.989 |
| Student guardians share knowledge about Tai Yai language, cultures, and wisdom. | 0.67 | 0.989 |
| Student guardians are assured MTB education will develop their children's knowledge and learnings. | 0.67 | 0.989 |
| There are MTB education plans. | 0.67 | 0.989 |
| There are MTB teachers. | 0.67 | 0.989 |
| School supports teachers for MTB education trainings. | 0.67 | 0.989 |
| There are some MTB activity budgets. | 0.67 | 0.989 |
| There are some budgets for MTB teachers' recruitment. | 0.67 | 0.989 |
| There are some budgets for MTB teachers' trainings. | 0.67 | 0.989 |
| Student guardian association is ready. | 0.67 | 0.989 |
| Local administrative organization is ready. | 0.67 | 0.989 |
| Riligious organization is ready. | 0.67 | 0.989 |
| 3) Costs and needs for MTB media | | |
| <i>To found stable learning bases in Tai Yai as L1 in school</i> | | |
| Picture stories exist. | 0.67 | 0.989 |
| Picture stories are required. | 0.67 | 0.989 |
| Stories with Tai Yai cultural backgrounds/illustrations exist. | 0.67 | 0.990 |
| Stories with Tai Yai cultural backgrounds/illustrations are required. | 0.67 | 0.989 |
| Educational games exist. | 0.67 | 0.989 |
| Educational games are needed. | 0.67 | 0.989 |
| Tai Yai folk plays exist. | 0.67 | 0.989 |
| Tai Yai folk plays are needed. | 0.67 | 0.989 |
| A collection of Tai Yai narratives exist. | 0.67 | 0.990 |
| A collection of Tai Yai narratives is needed. | 0.67 | 0.990 |
| Teaching and questioning techniques exist. | 0.67 | 0.990 |
| Teaching and questioning techniques are needed. | 0.67 | 0.989 |
| <i>To found listening-speaking bases in Thai as L2</i> | | |

Table 6 Validity and reliability statistics of items on the questionnaire parts 2-4 (cont.)

| Items | Validity (IOC) | Reliability (α) |
|--|-------------------|-----------------------------|
| TPR in Thai is emphasized. | 0.67 | 0.989 |
| TPR in Thai needs to be emphasized. | 0.67 | 0.989 |
| <i>To prepare for reading-writing bases</i> | | |
| Writing bases start with drawing pictures. | 0.67 | 0.989 |
| Drawing activities are required at the beginning. | 0.67 | 0.989 |
| Picture – letter activities exist. | 0.67 | 0.989 |
| Picture – letter activities are needed. | 0.67 | 0.989 |
| Creative writing through picture story telling activities exist. | 0.67 | 0.989 |
| Creative writing through picture story telling activities are needed. | 0.67 | 0.989 |
| <i>To develop reading-writing by Thai alphabet based Tai Yai</i> | | |
| Reading-writing primers exist. | 0.67 | 0.989 |
| Reading-writing primers are needed. | 0.67 | 0.989 |
| <i>To supplement reading-writing skills with Tai Yai reading materials</i> | | |
| Big books exist. | 0.67 | 0.989 |
| Big books are needed. | 0.67 | 0.989 |
| Small books exist. | 0.67 | 0.989 |
| Small books are needed. | 0.67 | 0.989 |
| 4) Creating an MTB curriculum | | |
| School curriculum is based on education standards. | 1.00 | 0.990 |
| School curriculum based on education standards is needed. | 1.00 | 0.990 |
| School curriculum connects the Thai with Tai Yai languages. | 1.00 | 0.989 |
| School curriculum that connects the Thai with Tai Yai languages is needed. | 1.00 | 0.989 |
| School curriculum connects the Thai with Tai Yai cultures | 1.00 | 0.989 |
| School curriculum that connects the Thai with Tai Yai cultures is needed | 1.00 | 0.989 |
| School curriculum relates to local needs. | 1.00 | 0.989 |
| School curriculum that relates to local needs is needed. | 1.00 | 0.989 |
| School curriculum emphasizes the development of both languages in all basic skills. | 1.00 | 0.989 |
| School curriculum that emphasizes the development of both languages in all basic skills is needed. | 1.00 | 0.989 |
| School curriculum supports an understanding of multi-cultural societies. | 1.00 | 0.989 |
| School curriculum that supports an understanding of multi-cultural societies is needed. | 1.00 | 0.989 |
| School curriculum supports the conservation of Tai Yai language and cultures. | 1.00 | 0.990 |
| School curriculum that supports the conservation of Tai Yai language and cultures is needed. | 1.00 | 0.989 |
| MTB teaching plans exist. | 1.00 | 0.989 |
| MTB teaching plans are needed. | 1.00 | 0.989 |
| Avg. | 0.78 | 0.990 |

Again, the quality items would have values of 0.67 or 1.00 for their validity, and for their reliability, the resulting correlation coefficient alpha would be greater than or equal to 0.7 ($\alpha \geq 0.7$) indicating that these items were both acceptable and reliable.

The data collected from the questionnaire items were analyzed quantitatively by using statistical methods: arithmetic sum, mean, mode, percentile, and standard deviation through the IBM SPSS Statistics 26 program as were the data collected from the survey form which were also described qualitatively through the author's observation, and some personal communications. The analysis of data from suggestions was also done qualitatively.

In relation to the research objectives, the data collected from the survey form for language and language use in school and the questionnaire items concerning the opinions and needs for MTB education (Tai Yai based) would meet objective 1 (the feasibility and

requirements of implementing MTB programs in border schools), the items related to costs and needs for MTB education would attain objective 2 (the nature and implementation of MTB materials), and the items about the creation of an MTB curriculum would reach objective 3 (the nature and implementation of MTB curricula). The items, moreover, concerning the basic information of the respondents plus their suggestions would add more details to the objectives and provide a profound insight into the implementation of MTB education (Tai Yai based) in Mae Hong Son Province.

Results

The following insights resulted from the examination of the information gathered via the study form and questionnaire, which ended up contributing to the accomplishment of the study’s goals.

1) According to an examination of the basic demographic data gathered from 109 repondents (teachers), there were more female instuctors than male teachers (40.4%), with a 36.7% age range between 30 and 39 years old, a 56% bachelor’s degree, and a 34.9% postgraduate degree. 69.7% of the population has between one and fifteen years of professional experience. Tai Yai instructors were outnumbered by non-Tai Yai instructors by 20.2%. 39% of all instructors are Tai Yai, 60% are non-Tai Yai, and 1% gave an anonymous comment. Figure 2 and Table 7 have specifics.

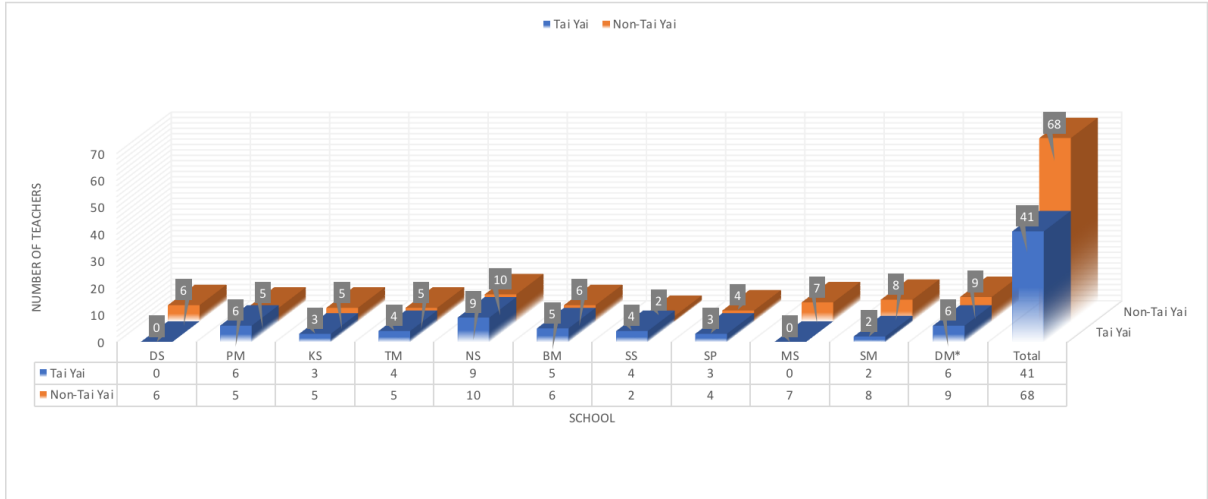


Figure 2 Number of Tai Yai vs non-Tai Yai teachers
 (Source: Panyawuthakrai, 2023)

Table 7 Number of Tai Yai and non-Tai Yai teachers

| School | Tai Yai | Non-Tai Yai |
|--------|-----------------|---|
| DS | 0 | 3 (Sgaw), 1 (Khammueang), 1 (Kayah), and 1 (Burmese) |
| PM | 6 | 3 (Khammueang) and 2 (Sgaw) |
| KS | 3 | 2 (Khammueang) and 3 (Sgaw) |
| TM | 4 | 2 (Laos), 1 (Khammueang), 1 (Thai), 1 (Yong) and 1 (Lisu) |
| NS | 9 | 4 (Khammueang) and 6 (Sgaw) |
| BM | 5 | 6 (Sgaw) and 1 (not specified) |
| SS | 4 | 2 (Thai), 1 (Lao) and 1 (Sgaw) |
| SP | 3 | 2 (Sgaw) |
| MS | 0 | 3 (Sgaw), 2 (Khammueang) and 1 (Thai) |
| SM | 2 | 5 (Sgaw) 2 (Lao) and 1 (Khammueang) |
| DM* | 6 | 9 (Sgaw) |
| Total | 41 (38%) | 68 (62%) |
| Total | 109 respondents | |

Note * DM includes all community child-care centres and CMRU Demonstrative School, Mae Hong Son Campus, **No ethnicity specified, 1 person (1%)

According to the table above, 62% of the population speak languages other than Tai Yai, which are listed in descending order as follows: 37% of the population is able to communicate in Sgaw Karen, 13% in Khammueang, 4% in Lao, 3% in Thai, and 5% in other languages, including Kaya Karen (1%), Burmese (1%), Yong (1%), Lisu (1%), and other that is not defined (1%). Additionally, in DS and MS schools, there are no Tai Yai-speaking teachers.

Based on whether or not the following student kinds speak Tai yai at any point in the school, the analysis of teacher-student language (2.3) is based on these student types: As indicated in Table 10 and Figure 3, students in early childhood, lower primary, and upper primary schools are represented by the items 2.3.1, 2.3.2, and 2.3.3, respectively.

2) Four types of information emerged from the study of the survey responses on language and language usage in schools: 2.1) Language used by students; 2.2) Language used by instructors; 2.3) Language used by teachers and students; and 2.4) Opinions on school support for Tai Yai teaching.

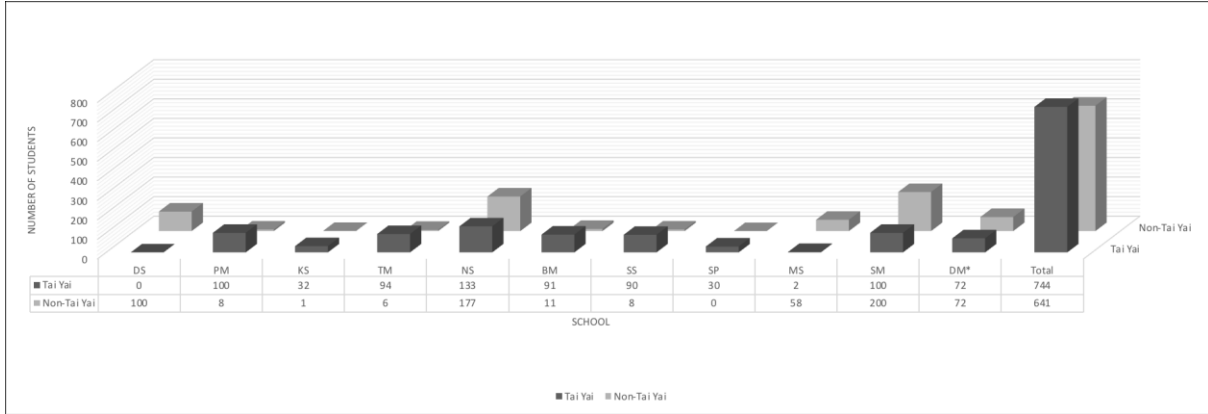


Figure 3 Number of Tai Yai vs non-Tai Yai students
 (Source: Panyawuthakrai, 2023)

Whether or not pupils speak Tai Yai at school is considered into account in the language analysis of students (2.1), which is represented in Table 8.

Table 8 Tai Yai vs Non-Tai Yai students by number

| Student | Tai Yai | Non-Tai Yai |
|---------|---------|---|
| DS | 0 | 70 (Kayah or Red Karen/Kayae, colloq.) and 30 (Burmese) |
| PM | 100 | 5 (Thai) and 3 (Black Lahu) |
| KS | 32 | 1 (Lisu or Liso, colloq.) |
| TM | 94 | 3 (Thai), 2 (Khammueang) and 1 (Sgaw) |
| NS | 133 | 158 (Kayah) 10 (Sgaw or White Karen, colloq.) 9 (Kayan or Long-necked Karen, colloq.) |
| BM | 91 | 7 (Sgaw) 1 (Lisu) 3 (Not specified) |
| SS | 90 | 4 (Sgaw) and 4 (Pa-O) |
| SP | 30 | - |
| MS | 2 | 58 (Kayah) |
| SM | 100 | 50 (Kayah) 100 (Sgaw) 50 (Lisu) |
| DM | 72 | 18 (Khammueang) 43 (Kayah) 6 (Sgaw) 5 (Not specified) |
| Total | 744 | 641 |
| | | 1,385 individuals (approximately) |

Figure 3 and Table 8 show that there were 54 to 46% more Tai Yai students than non-Tai Yai pupils. Following is a list of the non-Tai Yai languages in decreasing order: By comparison, Kayah was spoken by 59% of the population, Sgaw by 20%, Lisu by 8%, Burmese by 5%, Khammueang by 3%, Kayan by 1.5%, Thai by 1.25%, Pa-O by 0.5%, Black Lahu by 0%. The only schools with solely Tai Yai-speaking students are SS and PM daycare centers. The only school where Tai Yai is never spoken by the pupils are DS and MS daycare centers.

The examination of instructors’ language (2.2) is based on whether or not they use Tai Yai in the classroom. See Figure 4.

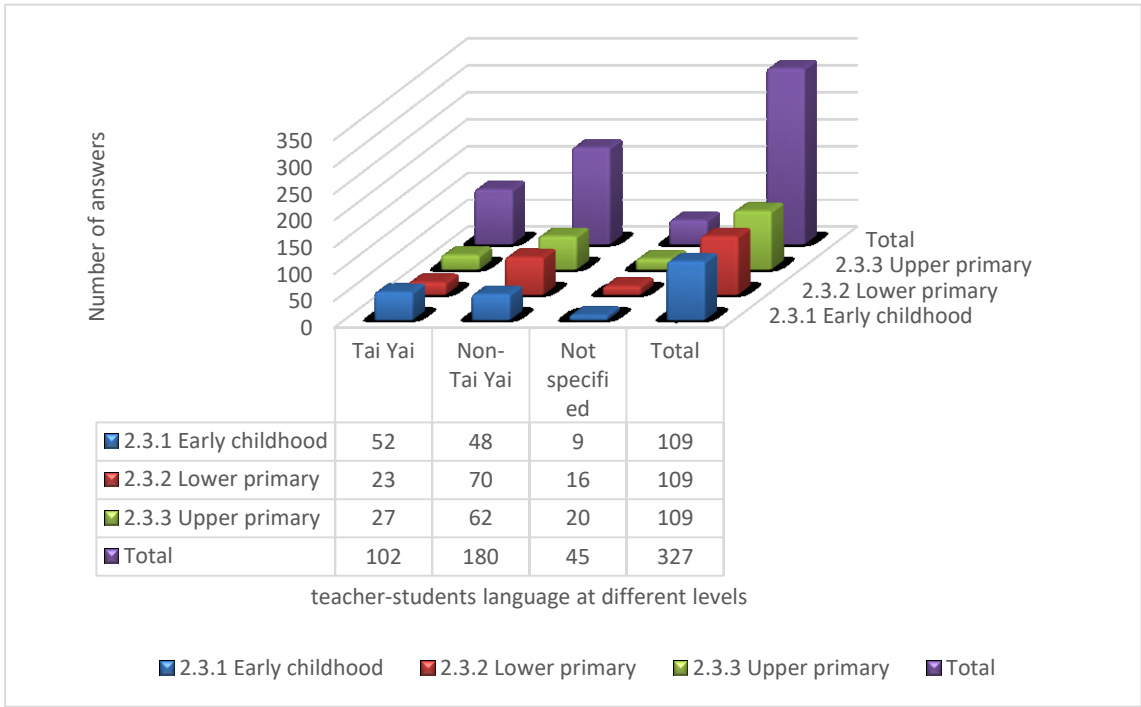


Figure 4 Teacher-students language at different levels
 (Source: Panyawuthakrai, 2023)

In any case, 48% of teachers speak Tai Yai to children in preschool (2.3.1), 21% to students in lower primary school (2.3.2), and 25% to students in upper primary school (2.3.3). In Tai Yai, only 31% of teachers communicate to students of all levels. It appears that more teachers speak Tai Yai to preschoolers than to pupils in primary school. In all, 14% of respondents did not provide any specifics.

Furthermore, some comments indicate that the majority of teachers refrain from using Tai Yai in the classroom. However, some of them only use it sparingly and merely when necessary, switching to Thai the majority of the time. Furthermore, there were no findings regarding the subjects in which they “always” speak Tai Yai.

Based on whether or not: 2.4.1) a master of Tai Yai teaching was employed; 2.4.2) he or she is hired (in 2020); and 2.4.3) teachers who are fluent in both Thai and Tai Yai are necessary, as stated in Table 11 and Figure 4, the analysis of teachers’ perceptions regarding the school support for Tai Yai teaching (2.4) is conducted.

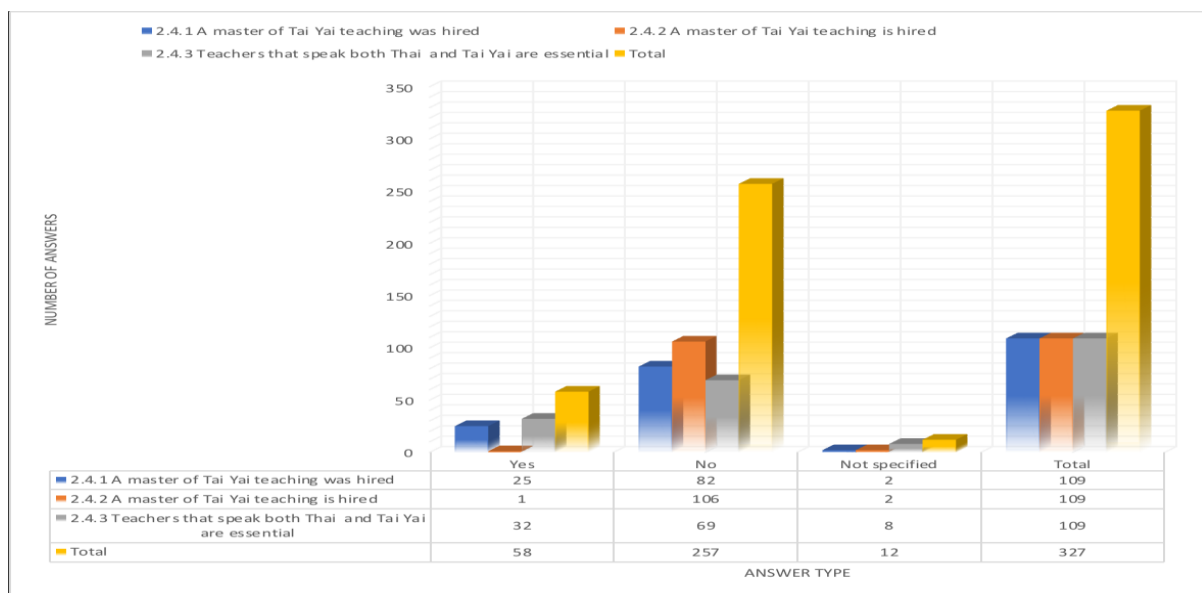


Figure 5 School supports on Tai Yai teaching
 (Source: Panyawuthakrai, 2023)

In responding to the question of whether or not the school director has previously hired a master of Tai Yai teaching (2.4.1), 75% said ‘no’ while 23% said ‘yes’. 97% of respondents said ‘no’ to the question about whether the school’s director hired a master of Tai Yai to teach this year (2.4.2). Only 29.5% of respondents agreed, 63% disagreed, and 7.5% were undecided on the question of whether bilingual teachers are required (Thai-Tai Yai) (2.4.3). It appears that over 80% of respondents opposed Tai Yai’s teaching in schools.

Additionally, it appears from some comments that the majority of instructors and pupils have an excellent understanding of both Thai and Tai Yai.

3) The questionnaire results on the respondents’ perceptions about MTB bilingual education were analyzed, and three types of information were found: 3.1) opinions and needs regarding MTB bilingual instruction (Thai-Tai Yai based); 3.2) opinions and needs regarding the forms of MTB bilingual teaching; and 3.3) opinions on the instructors’ readiness for MTB bilingual instruction (Thai-Tai Yai based), as shown in Table 9 and Figure 6.

Table 9 In favor of MTB bilingual education (Thai-Tai Yai based)

| Item | \bar{x} | SD | Opinion/In-favor levels (%) | | | | |
|--|-----------|------|-----------------------------|-------|------|------|------|
| | | | 5 | 4 | 3 | 2 | 1 |
| 3.1 MTB bilingual instruction | 2.85 | 1.05 | 2.65 | 23.35 | 45.5 | 17.5 | 10.8 |
| 3.2 MTB bilingual instruction type | 2.44 | 1.05 | 1.9 | 12.2 | 43.2 | 20.6 | 22.1 |
| 3.3 How prepared the teachers were for MTB bilingual instruction | 2.38 | 1.01 | 1.8 | 12.2 | 44.3 | 17.5 | 24.2 |
| Avg. | 2.56 | 1.04 | 2 | 16 | 44 | 19 | 19 |

Note 5 = totally agreed/most, 4 = agreed/much, 3 = can't decide/moderate, 2 = not agreed/low, and 1 = totally disagreed/very low

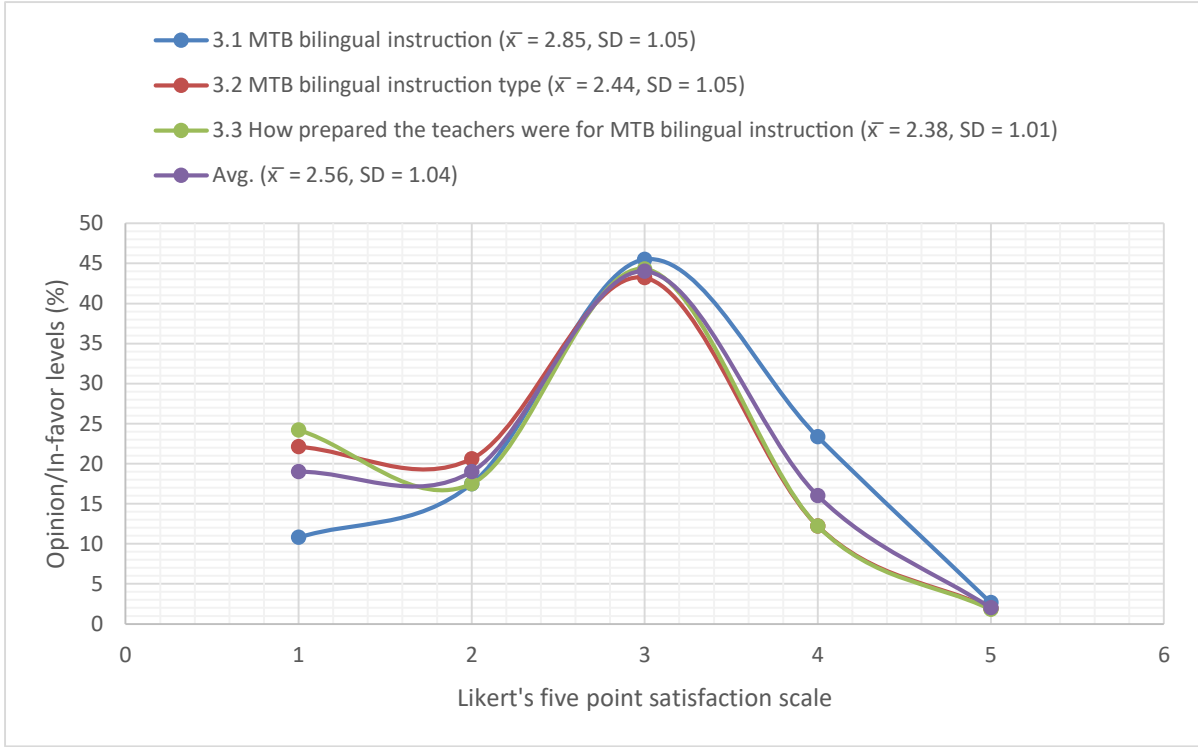


Figure 6 In favor of MTB bilingual education (Thai-Tai Yai based)
 (Source: Panyawuthakrai, 2023)

The table and the figure reveal that 44% of the respondents are unsure of their need for MTB bilingual instruction (3.1), its types (3.2), and readiness for the program (3.3). Additionally, only 18 individuals support the program, while 38% oppose it.

4) Five types of information concerning costs and needs for MTB materials were analyzed from the data gathered from the questionnaires: 4.1) constructional elements in Tai Yai (L1); 4.2) creating Thai (L2) basic listening-speaking materials; 4.3) preparing for Thai literacy; 4.4) increasing Tai Yai literacy with the Thai alphabet; and 4.5) reading materials to enhance Tai Yai literacy, as in Table 10 and Figure 7.

Table 10 Costs and needs for MTB materials

| Item | \bar{x} | SD | Opinion/In-favor levels (%) | | | | |
|--|-----------|------|-----------------------------|------|-------------|------|-------------|
| | | | 5 | 4 | 3 | 2 | 1 |
| 4.1 Constructional elements in Tai Yai | 2.63 | 1.24 | 7.3 | 19.5 | 28.3 | 16.5 | 28.5 |
| 4.2 Creating Thai basic listening-speaking materials | 2.69 | 1.13 | 8.8 | 14.3 | 37.0 | 20.1 | 19.9 |
| 4.3 Preparing for Thai literacy | 2.65 | 1.20 | 6.7 | 14.6 | 32.5 | 24.1 | 22.2 |
| 4.4 Increasing Tai Yai literacy with the Thai alphabet | 2.29 | 1.22 | 6.6 | 8.6 | 28.9 | 14.2 | 41.8 |
| 4.5 Reading materials to enhance Tai Yai literacy | 2.37 | 1.24 | 9.0 | 10.3 | 28.4 | 18.9 | 33.5 |
| Avg. | 2.53 | 1.20 | 7.7 | 13.5 | 31.0 | 18.8 | 29.2 |

Note 5 = totally agreed/most, 4 = agreed/much, 3 = can't decide/moderate, 2 = not agreed/low, and 1 = totally disagreed/very low

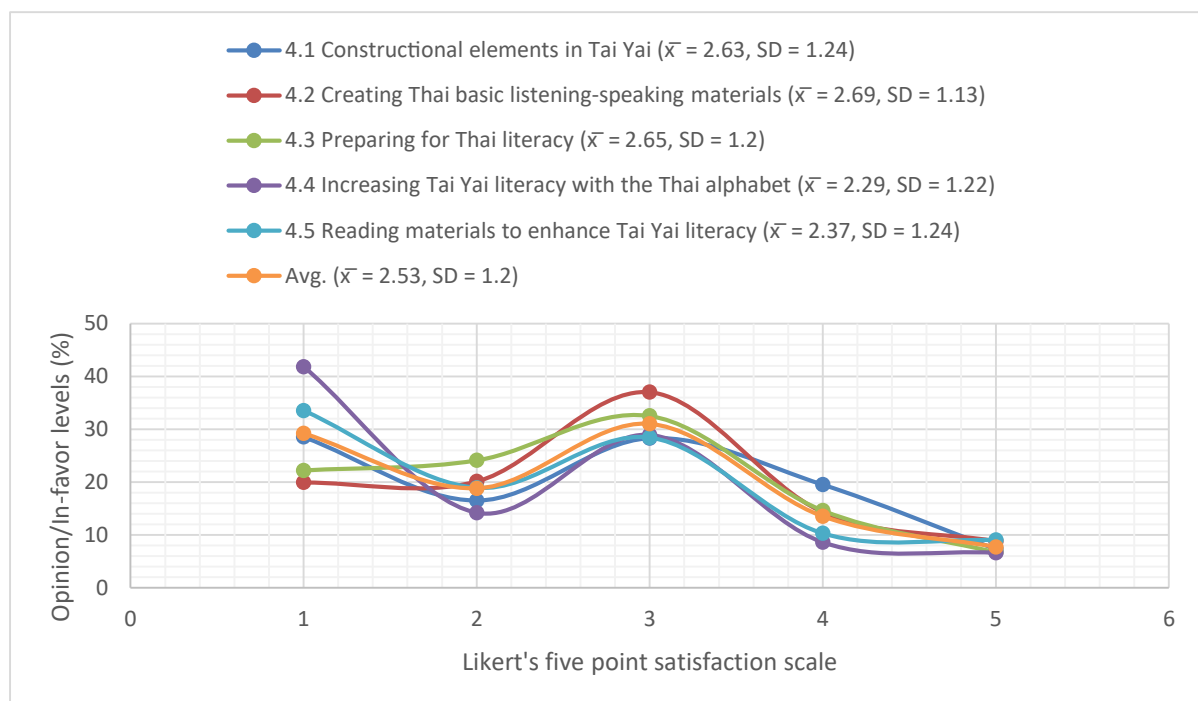


Figure 7 Costs and needs for MTB materials
(Source: Panyawuthakrai, 2023)

The table and figure demonstrate that the majority of items (4.1, 4.4, and 4.5) have the highest percentages that fall in descending order on level 1 (28.5%, 41.8%, and 33.5%, respectively)—indicating that Tai Yai materials of all kinds are of slightest interest. The remaining items (4.2 and 4.3, respectively) are on level 3—meaning that Thai materials are favourable; even the average high percentage is between levels 3 and 1. In other words, over half of the teachers were uninterested in or showed little interest in MTB materials.

5) The following eight related concerns about the curriculum's ideal features were investigated in the analysis of the data collected from questionnaires on MTB curriculum costs and needs: 5.1) be established using national educational standards; 5.2) link the Tai Yai language to the Thai language; 5.3) connect the Tai Yai cultures to Thai cultures; 5.4) correspond to the local demands; 5.5) prioritize the improvement of the Thai and Tai Yai language abilities; 5.6) promote the knowledge and understanding of multiculturalism; 5.7)

support the conservation of the Tai Yai language and cultures; and 5.8) have instructional plans. See Table 11 and Figure 8 for specifics.

Table 11 Costs and needs for MTB curriculum’s ideal features

| Item | \bar{x} | SD | Opinion/In-favor levels | | | | |
|--|-----------|------|-------------------------|------|-------------|------|-------------|
| | | | 5 | 4 | 3 | 2 | 1 |
| 5.1 be established using national educational standards | 3.22 | 1.43 | 27.5 | 12.3 | 30.7 | 17.3 | 12.3 |
| 5.2 link the Tai Yai language to Thai language | 2.26 | 1.43 | 4.1 | 7.6 | 35.5 | 15.7 | 36.7 |
| 5.3 connect the Tai Yai cultures to Thai cultures | 2.45 | 1.17 | 4.3 | 11.4 | 33.3 | 25.9 | 24.7 |
| 5.4 correspond to the local demands | 2.66 | 1.21 | 10.7 | 9.7 | 39.6 | 21.9 | 17.8 |
| 5.5 prioritize the improvement of the Thai and Thai Yai language abilities | 2.48 | 1.17 | 5.1 | 11.4 | 31.5 | 23.3 | 28.3 |
| 5.6 promote the knowledge and understanding of multiculturalism | 2.52 | 1.10 | 7.4 | 10.6 | 32.5 | 29.9 | 19.2 |
| 5.7 support the conservation of the Tai Yai language and cultures | 2.68 | 1.23 | 8.2 | 10.7 | 37.1 | 23.3 | 20.9 |
| 5.8 have instructional plans | 2.36 | 1.15 | 6.0 | 7.8 | 38.0 | 17.2 | 31.2 |
| Avg. | 2.58 | 1.24 | 9.2 | 10.2 | 34.8 | 21.8 | 23.9 |

Note 5 = totally agreed/most, 4 = agreed/much, 3 = can’t decide/moderate, 2 = not agreed/low, 1 = totally disagreed/very low, \bar{x} = the sample mean of a distribution, and SD = standard deviation

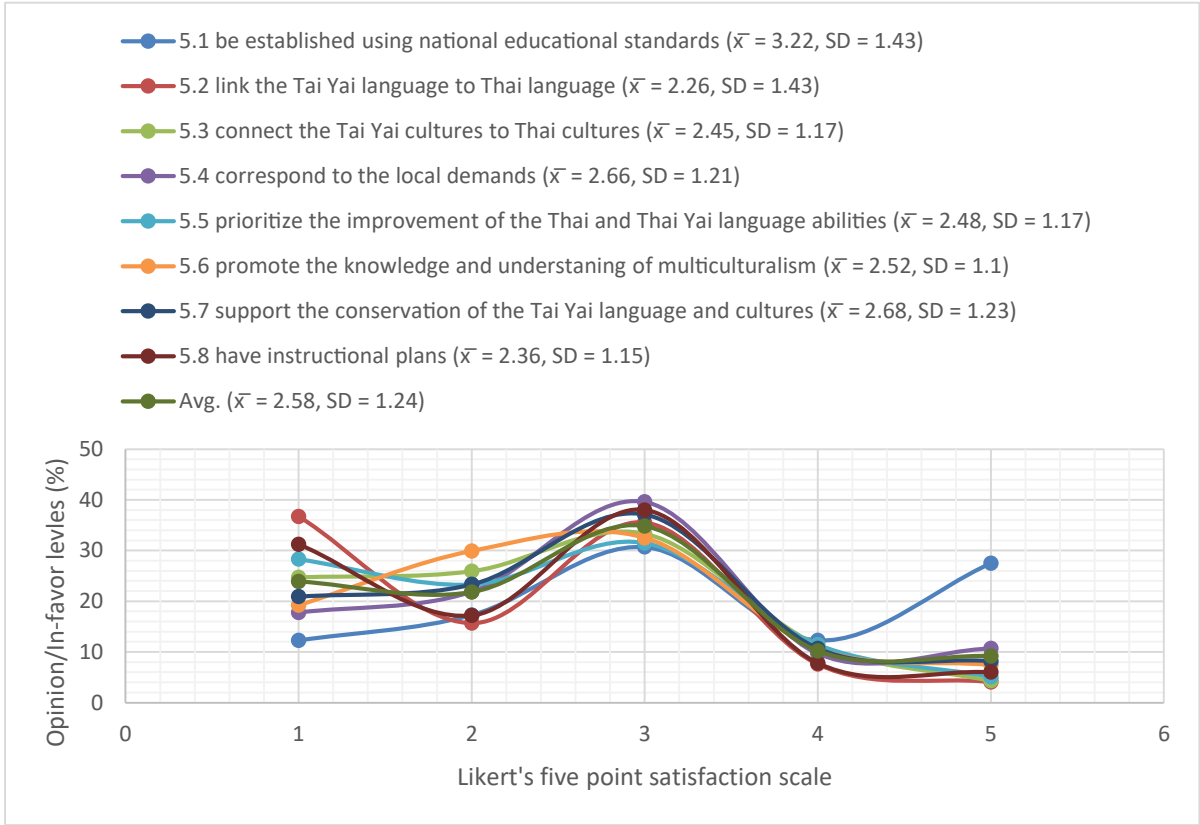


Figure 8 Costs and needs for MTB curriculum’s ideal features
 (Source: Panyawuthakrai, 2023)

As shown in bold numbers in Table 14 and Figure 8, the highest percentage is found in level 3 and in all except item (5.2). The second highest percentage is either levels 1 or 2 and is found in all except items (5.1 and 5.2), where it falls in levels 5 and 3, respectively. The level with the greatest average percentage is level 3, whereas the level with the next-highest average percent is level 1. This suggests that most teachers are not particularly interested in addressing the MTB curriculum.

6) Since there are a few details from the suggestion survey form, the analysis is not very thorough. Although MTB bilingual education on a Thai-Tai Yai base as introduced through these survey forms is highly aimed at improving the quality of education in Pang Mu border schools as well as conserving the Tai Yai language and cultures, there are two main personal views—it is likely to work in practice because of two reasons: firstly, a majority (actually about half) of students are Tai Yais themselves and capable of speaking both Khammueang and Thai, so there is no worry about their (oral and aural) understanding in Tai Yai or Khammueang and Thai; and secondly, several non-Tai Yai students already have a command of Tai Yai and Thai for themselves.

Discussions

With over 14 different ethnic minority groups coexisting peacefully in a total of 415 villages over 45 Tambon (subdistricts), Thailand's Mae Hong Son Province is incredibly varied, both linguistically and culturally. Most native locals generally speak different languages as L1 which mainly belong to four language families: Tai-Kadai (Tai Yai, Tai Yuan or Khammueang); Sino-Tibetan (Burmese, Lahu—black and red, Lisu, Yunnan Chinese, Sgaw, Kayah, Pwo, Pa-O, Kayan, Kayaw); Hmong-Mien (Hmong—white, green); and Austroasiatic (Lawa—Lua, Lavue, Lawua). However, only eight languages (Tai Yai, Sgaw, Khammueang, Lisu, Yunnan Chinese, Kayah, Kayan, Kayaw, and Pa-O) were found in the Pang Mu border region. Additionally, it is appealing to note that despite there being six Karenic languages spoken throughout Thailand—Sgaw, Kayan, Kayah, Kayaw, Pa-O, and Pwo (Luangthongkum, 2014), only five of them—excluding Pwo—are spoken in Pang Mu. The majority of non-native languages, however, are Lao and Thai.

Due to a huge population, Tai Yai appears to be the primary language of exchange among these them, including multilingual school instructors, as opposed to Khammueang and Thai, which is the official language of teaching and communication. Most Tai Yais, however, are more proficient in Khammueang than Thai, and some of them also speak Sgaw or other minority languages.

Regarding MTB bilingual education with the Thai-Tai Yai base, local school instructors appear to be hesitant in backing the program, especially those non-Tai yai teachers who constitute about half of the population. Given that practically all students already comprehend both Tai Yai and Thai themselves, it is not yet required urgent. Besides, mastering Thai reading, and proficiency is the final objective of training students must complete to be able to do better on the national examinations, PESA and ONET. In contrast, the MTB program's preservation of Tai Yai's language and cultures and its facilitation of improved communication with the children's parents or legal guardians are the only aspects that some teachers felt to be positive.

From an alternative viewpoint, I believe that MTB-MLE (Multi-Lingual Education) based on Thai-Tai Yai, Thai-Sgaw, or even Thai-Kayah may operate more effectively and be more prevalent due to a sizable population of instructors and pupils. Additionally, teachers typically employ a particular kind of MTB bilingual education (Thai-Tai Yai based)

unintentionally through more restricted channels—listening and speaking Tai Yai rather than Thai.

The investigation also revealed two additional issues: the instructors themselves did not have a thorough concept of MTB multilingual education, and both the former and present school leaders failed to acknowledge the significance and worth of the children's mother languages.

Thus, these have a detrimental impact on the notions of cautiously proposing and creating the MTB fundamental resources and curriculum, which are centred on the development of Thai literacy four skills rather than Tai Yai speaking and listening skills. One aspect of the school curriculum that has been identified is that most schools' curricula, which primarily depend on the national core curriculum standards for basic education, have been out of date for over 14 years—since they were first introduced in 2008 (Ministry of Education, 2008)—and do not align with the national examinations (PESA and ONET), which are updated annually.

As a result, the test results for Primary School Level 6 students taking the Ordinary National Educational Test (O-NET) from 2008 to 2020 from general small and remote schools and Border Patrol Police learning centres nationwide were shockingly below 50% on average of standard level in all core subjects, including math and science, as well as language subjects like Thai and English (The National Institute of Educational Testing Service: NIETS, 2020; Office of the National Economic and Social Development Council: NESDC, 2019). This is consistent with the state of practically all schools in the Pang Mu border area of Mae Hong Son Province.

Conclusion and suggestions

Based on the findings, this study draws three conclusions that address the study's three main goals: 1) the feasibility and requirements of implementing MTB program(s) in border schools; 2) the nature and implementation of MTB materials; and 3) the nature and implementation of MTB curricula.

Conclusion 1. According to results 1, 2, 3, and 6, it is feasible to anticipate the potential and necessity of implementing MTB programs in Pang Mu border schools due to the teachers' positive need, despite their uncertainty about the type of MTB and their lack of readiness for the program; and the fact that students are either bilingual or multilingual with some proficiency in Tai Yai or Thai.

Conclusion 2. According to result 4, the type(s) of MTB bilingual education that would be essentially practical for the teachers and students would be those that use Tai Yai (L1 or L2) as the auxiliary language of instruction and Thai (L2) as the primary language of instruction, as needed in activities to prepare students for Thai literacy. Therefore, there is a greater need for foundational materials in Thai than in Tai Yai (See Issues 4.2 and 4.3 in Table 11). Contrarily, any MTB program that promotes Tai Yai literacy or creates the language's core resources has major unintended consequences (See Issues 4.1, 4.4, and 4.5 in Table 11).

Conclusion 3. According to result 5, the MTB curriculum may be anticipated and should be finely featured with Thai-Tai Yai cultural and language ties, national educational standards, and the needs of the community. The program should, if required, be implemented specifically using Thai (L2) and its cultural traits.

The study on teachers' opinions of MTB bilingual education (Thai-Tai Yai based) in Pang Mu border schools that use Tai Yai (language and culture) as the L1 for fundamental language skills on speaking, listening, reading, and writing in Tai Yai may not be entirely

practical. However, the MTB bilingual education program, as well as the creation of literacy foundational materials and its curriculum, could be more readily accepted if it were partially based on Tai Yai as L1/L2 for basic literacy in listening and speaking only, and on Thai as L2 for fully basic language skills.

The research's conclusions may benefit 1) the development of educational systems and procedures for children of ethnic minorities; 2) bilingual/multilingual education in other places; 3) serving as recommendations for thinking about different types of education that are appropriate for ethnic minorities. It would be ideal for future research if: 1) more research tools such as in-depth interviews, forms for small group interviews, and observation forms were required; 2) the questionnaire should be adapted to match the understanding of the respondents; and 3) the target children's learning achievement in MTB-MLE experimental groups were compared.

New knowledge and the effects on society and communities

This study produced both great results and some unexpected findings, which may provide some invaluable information about 1) the geographical features of 13 communities in the Pang Mu area, 2) educational staff in schools overseen by the Primary Education Commission, 3) ethnic school students, 4) opinions and demands regarding instructional management, 5) learning media creation, and 6) bi/multilingual school curriculum towards at least four relevant sectors: Office of Mae Hong Son Culture concerning ethnic culture and language policies and plans, Office of Mae Hong Son Primary Education concerning primary education policies and plans, community schools concerning providing basic education to children, and community children concerning gaining a basic foundation in education. Additionally, a seminar was recently held with staff from Mae Hong Son College of Chiang Mai Rajabhat University (CMRU) to organize this year's activities for children in Mae Hong Son Province with assistance from the Child's Dream Foundation (CDF). The Foundation for Applied Linguistics (FAL), an organization that primarily provides services for children of ethnic minorities about their learning through L1 as a base, hosted the conference. Actually, prior to this, there had been collaborative initiatives for MTB education in many schools in Chiang Mai Province that were run by many sectors namely FAL, Pestalozzi Children's Foundation (PCF), CDF, CMRU by Faculty of Education and Digital Education, and Chiang Mai University (CMU). Successful outcomes of these initiatives include, for instance, a teacher training project on the creation of a digital MTB/MLE curriculum via CMRU Mass Open Online Courses (MOOCs), Memoranda of Understanding (MOU), an academic services operation, and classroom research proposals. These results may have significant implications for MTB education in Mae Hong Son Province.

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