

How English-Medium Instruction Affects Language and Learning Outcomes of Children in the Maldives

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ABSTRACT: Whilst the vast majority of the Maldivian population speak Dhivehi at home, English typically serves as the only medium of instruction (MoI) starting from primary school. Teachers have expressed their concerns regarding educational quality, as many children are taught in a language they do not master sufficiently. The present study aimed to investigate the level of second language (L2) proficiency in relation to reading abilities and mathematical skills in 25 ten- to twelve-year-old children living in the Maldives. The results showed relatively low performance on all tasks, despite normal nonverbal intelligence. Moreover, we found a significant relation between English vocabulary knowledge and reading accuracy. Our findings contribute to a growing body of research suggesting that using an L2 as the only MoI may be detrimental to literacy development and learning outcomes. Considering the objectives of educational quality, language maintenance of Dhivehi and the pragmatic value assigned to English, we argue in favour of a bilingual model of education, in which the importance of native language development is emphasized.

Keywords: medium of instruction, learning outcomes, literacy, submersion, educational language policy

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How English-Medium Instruction Affects Language and Learning Outcomes of Children in the Maldives

Introduction

As in many other post-colonial countries, the language of education in the Maldives is English. Although the large majority of people in the Maldives speak Dhivehi as their first language (L1), English is virtually the only medium of instruction (MoI) in schools (Mohamed, 2019). In addition to concerns regarding threatened linguistic diversity and cultural identities (Hanna, 2011; Rapatahana & Bunce, 2012; Skutnabb-Kangas, 2001), the use of English as the only MoI may be problematic for learning outcomes, since children are educated in a language they do not master and by educators who teach in their second language (L2) (Benson, 2004).

The national school statistics released by the Maldivian Ministry of Education show that academic achievement in the Maldives is a reason for concern (Education Sector Analysis Maldives, 2019). Although English tends to be regarded as the gateway to success, educators have raised concerns about the effect of using only English on the quality of education (Mohamed, 2013). In order to investigate whether the poor educational outcomes in the Maldives may indeed stem from insufficient proficiency in the language of instruction, this study examined the level of English, in relation to literacy and numeracy skills, in a group of Maldivian children.

The use of English as the MoI is not unique to the Maldives; there seems to be a global trend towards English-medium education in non-Anglophone countries, which has been strongly criticized for threatening local languages and cultures (Rapatahana & Bunce, 2012). Dearden (2014) conducted a large-scale survey in 55 different countries, showing a rapid, worldwide expansion of English-medium instruction at all levels of education. She recommends a research-based approach in national and international policy-making, but as she points out, there is little evidence to date on how English-medium instruction affects learning outcomes and the acquisition of English as an L2 (but see Gopang et al., 2018; Heugh et al., 2007; Treffers-Daller et al., 2022; Tsimpli et al. 2020). By studying an understudied country like the Maldives, which

is not present in Dearden's (2014) study, we aim to contribute to filling this gap. We do this by focusing on some critical measures of learning outcomes, including literacy.

First, we will elaborate on the linguistic and educational context of the Maldives, after which we will discuss previous research on the choice of MoI, as well as possible advantages of mother tongue-based education. Then, we will present our methods and results, followed by a discussion with implications for educational language policy.

The Case of the Maldives

The Maldives is a small island nation in the Indian ocean, consisting of 1,192 islands, 187 of which are inhabited by a total population of 568,000 people (Maldives Bureau of Statistics, 2021). The official national language and the language used for everyday communication is Dhivehi, an Indo-Aryan language. There are several regional dialects which may differ substantially from each other, especially at the level of phonology. However, the variety spoken in the capital Malé is considered to be the standard language, which is used for all written communication, on television and in politics, and which is taught in schools as a subject. Moreover, the Dhivehi language has its own script, called Thaana, which is unique to the Maldives (Fritz, 2002; Mohamed, 2019).

In the 19th century the Maldives archipelago was colonised by Great Britain, until it reached independence in 1965. Yet, when formal education was introduced for the local population, between the 1920s and the 1940s, the MoI was Dhivehi, as it was in the semi-formal religious schools that preceded colonial rule. The schools in Malé were the first to switch to English, as they started hiring foreign English-speaking teachers and implementing international examinations in the beginning of the 1960s. From the 1970s, tourism became increasingly important for the Maldives, and this, in combination with the use of English for examinations at the level of secondary education, promoted the status of English as a symbol for both economic and academic progress. There was a discrepancy in educational outcomes between Malé schools (which used English as the MoI) and schools on the other, more sparsely populated islands. Therefore, a nation-wide literacy campaign was initiated in the 1980s, coupled with the introduction of a national curriculum in 1984. Initially, a dual system was adopted, with schools

in Malé using English and schools on the other islands using Dhivehi, but this soon led to a shift to English as a MoI throughout the country. Although the government never released an official policy statement regarding the MoI, by 2000 all schools were teaching in English. In fact, many schools had adopted full English immersion programmes in which the use of Dhivehi was completely banned (Mohamed, 2019; Shiuna & Sodiq, 2013).

During the last decades, attention has shifted to the protection of Dhivehi as national linguistic heritage. In 2008 Dhivehi was declared the only official language of the Maldives and the Dhivehi Language Act of 2011 stated that Dhivehi must be prioritised over other languages (Maldives Constitution, 2008; Mohamed, 2019; The President's Office, Republic of the Maldives, 2011). In 2012 a law was passed stipulating that Dhivehi should be the MoI in preschools (Mohamed, 2019, 2021; National Institute of Education, 2015), even though Mohamed (2016) demonstrated that in practice English is still used.

When it comes to primary, secondary and tertiary education, however, English-medium instruction is still unchallenged at a policy level. The New National Curriculum of 2015 declared English to be the MoI in primary schools (National Institute of Education, 2015). While the government recommended a gradual shift to English, starting with both languages in the first years of primary school, policy and practice do not overlap (Mohamed, 2013, 2016), and most schools teach almost exclusively in English from the first grades. Moreover, students are assessed in English using the Cambridge International Certificate exams (Yamada et al., 2015). Besides three religious schools teaching in Arabic, all schools in the country currently teach in English. The only subjects that are taught in Dhivehi are Dhivehi, Arabic and religion. Children also learn to read and write in Dhivehi, and they learn to read the Arabic script to recite the Quran. (Mohamed, 2019; Shiuna & Sodiq, 2013).

Although school attendance is high up to the lower secondary level, the quality of education lags behind; in 2016 37.8% of students in Grade 4 and 43.2% in Grade 7 failed the National Assessment of Learning Outcomes (NALO), which examines literacy and numeracy skills. Furthermore, academic achievement still seems to be much higher in the capital Malé than on the

other islands (Education Sector Analysis Maldives, 2019; UNICEF Maldives & National Bureau of Statistics, 2018; see also Aturupane & Shojo, 2012).

These poor results have been linked to the fact that English is used as the only MoI (Mohamed, 2013; Shiuna & Sodiq, 2013). From the beginning of primary school, Maldivian children are educated in a language they do not speak yet. Such a system has been referred to as "submersion," analogous with throwing someone in the water without teaching them how to swim (Skutnabb-Kangas, 2000). Another reason may be the insufficient English proficiency of teachers at the primary school level (Saeed & Moreira, 2010). In the study by Mohamed (2013), only 5% of teachers were confident that they "excelled" in English oral proficiency, compared to 90% in Dhivehi. This is likely to be an issue also in many other non-Anglophone countries where English-medium instruction is the norm. The following sections will further explore the reasons why English is nevertheless adopted as the MoI, as well as the consequences that such a decision may have on educational outcomes.

The Choice of Medium of Instruction

As argued by Hanna (2011), countries are faced with conflicting interests regarding the MoI in schools. On the one hand, there are goals of global competition, a desire for progress and access to higher education, which emphasise the importance of English. On the other hand, there are objectives related to linguistic diversity and human rights (specifically, the right to receive an education in one's native language), as well as to the optimal suitability of the native language for learning. A nation-wide education forum organised to gain stakeholder perspectives on the Maldivian education system revealed exactly those conflicting interests; while the importance of English for progress was emphasised, participants also acknowledged the importance of Dhivehi for the preservation of Maldivian culture and for children's early development (Shiuna & Sodiq, 2013).

Similar attitudes were observed by Mohamed (2013), who investigated the perspectives of Maldivian students, teachers and parents on the role of English in education. The results showed that while only 6% of the teachers believed that English should be the only MoI throughout the school years, 73.3% of the parents believed that this should be the case. As for the students, 34%

indicated they would prefer to be taught in Dhivehi, while 60% preferred English. With respect to language attitudes, English was regarded as "a superior language to Dhivehi" by 30% of the teachers, 70% of the parents and 69.8% of the students, and all groups agreed that English is "a more rich language" than Dhivehi (a view which is shared by Maldivian policy makers; see Mohamed, 2019). Furthermore, all groups confirmed that English can help students find a good job, while opinions were divided about the importance of Dhivehi in this respect.

Although respondents to Mohamed's study generally agreed on the prestigious status of English and its importance for academic and economic success, concerns were raised regarding the use of English as the only MoI, especially by educators. The following quote, provided by a teacher in Mohamed (2013, p. 195), clearly illustrates the concern that English submersion affects the quality of education.

When they start school, they are so young. They have barely mastered their own language. But at school, they have to learn everything in English and if they don't understand the teacher or the lesson, they suffer. Many students fail to achieve high marks because of the barrier of language, not because of they have difficulties with the concept.

Similar attitudes have been observed in Hong Kong (Tung et al., 1997) and Ethiopia (Heugh et al., 2007), with parents and students showing a clear preference for English-medium instruction over mother tongue-based education, despite concerns regarding educational quality.

Several studies have shown that students who receive instruction in their native language tend to outperform students in English-medium programmes. For example, Indian children who are taught in their native language have been found to show advantages with respect to literacy development in the regional language as well as general learning outcomes (Tsimpli et al., 2020; Vogelzang et al., under review), while the oral proficiency levels of children in English-medium programmes have been found to be insufficient to understand textbook materials (Treffers-Daller et al., 2022). Similarly, Gopang et al. (2018) found that mother-tongue instruction led to improved comprehension of natural science in students in Pakistan, and Heugh et al. (2007)

found that Ethiopian children in regional-language schools outperformed children in English-medium schools in all subjects, including English.

Advantages of Mother Tongue-Based Education

There are several reasons why using the native language in primary school may improve the quality of education. First of all, it is beneficial for content learning. Children have been estimated to need at least five to seven years of exposure before effective content learning through the exclusive use of the L2 is possible (Hakuta et al., 2000), as cognitive academic language proficiency requires deeper understanding than basic interpersonal communication (Cummins, 1979a). English submersion education tends to be characterized by teacher-centered lecturing and passive rote learning (i.e., memorizing by repetition) (Benson, 2004), and the Maldives appear to be no exception to this (Mariya, 2012). However, using the native language, perhaps in a bilingual program, would allow children to interact with the teacher in a more natural way, which would support meaningful content learning (Baker, 2001; Benson, 2004).

A second argument in favour of mother tongue-based education is that involving the native language promotes linguistic development. The development of the native language continues into adolescence (Dutcher & Tucker, 1996), and in order to reach high lexical competence and fully acquire complex syntactic structures, children need meaningful input. The school context is optimally suited for this. Furthermore, high competence in the L1 facilitates L2 learning, as certain linguistic skills may be transferred from one language to the other (e.g., Cummins, 1979b, 2000; Proctor et al., 2017; Sierens et al., 2019; Thomas & Collier, 2002). By explicitly highlighting differences between the two languages, and thus increasing metalinguistic awareness, such positive transfer may be facilitated (Benson, 2009).

Thirdly, mother tongue-based education facilitates early literacy acquisition, as it supports the understanding of correspondences between sounds and symbols, or meanings and symbols. This knowledge can at a later stage be transferred to the L2 (Cummins, 1979b, 2000). Furthermore, vocabulary knowledge, which is typically more limited in L2 learners (Bialystok et al., 2010), has been found to be a strong correlate of reading development (Andrews, 2008; Ouelette, 2006; Verhoeven, 2000). Children can also benefit from guessing strategies when learning to read (i.e.,

predict upcoming sounds or words), but only when they understand the language. In contrast, when children learn to read exclusively in the L2, they may be able to effectively acquire decoding skills, but reading comprehension is expected to be delayed (Benson, 2004).

A final reason for involving the native language in education is that it enhances children's self-confidence and that it strengthens their sense of identity (Baker, 2001; Benson, 2009). As a result, mother tongue-based instruction may improve students' motivation as well as self-efficacy (Salili & Tsui, 2005). This is illustrated by the following quote from a student in the Maldives, taken from Mohamed (2013, p. 195).

Because we sit for an international exam we have to learn English and learn it very well. Otherwise it will affect all our grades. But learning everything in English is not easy for me. If teachers explain in Dhivehi I will like it better and understand more.

Research Questions and Hypotheses

While teachers in the Maldives have expressed their concerns about the use of English as the only MoI for the quality of learning, to our knowledge there have been no studies carried out in the Maldives that examined children's actual learning outcomes in relation to their English proficiency. Therefore, the present study examines the level of English as well as reading abilities and mathematical skills in a group of children attending 5th and 6th grade of a public school on a small island in the Maldives. We focus on the last two grades of primary school, when children should have acquired at least basic literacy and numeracy.

Our research questions are as follows:

- (1) What is the children's level of English (vocabulary and morphosyntax) in Grade 5 and 6?
- (2) How do children perform on a reading test in English?
- (3) To what extent can their reading performance be correlated with different components of language proficiency?
- (4) How do children perform on different mathematics tasks?

(5) To what extent can their performance in mathematics be correlated with their language proficiency and their reading skills?

Based on the national school statistics and the observation that learning outcomes are most problematic on smaller islands (Education Sector Analysis Maldives, 2019; UNICEF Maldives & National Bureau of Statistics, 2018), we expect relatively low performance on language, reading and mathematics tasks. Hypothesizing that oral language and literacy development are interrelated, we expect reading performance to be correlated with language abilities (vocabulary and morphosyntax) in English. Hypothesizing that the use of a language which is not mastered sufficiently as the only MoI may also be detrimental to non-linguistic learning outcomes, we predict that language abilities and reading performance will be related to performance in mathematics. Since mathematical problems that are presented in a narrative format (i.e., word problems) require linguistic understanding and text comprehension, language and reading abilities are expected to be more important for word problems than for subtraction or division tasks.

Methods

Participants

We tested 25 children (15 boys, 10 girls) attending a public school on a small island in the Maldives. Of these children, 14 were in 5th grade and 11 were in 6th grade of primary school; they were between ten and twelve years old ($M = 10$ years and 11 months, $SD = 7$ months). The official MoI of the school was English.

Short interviews were conducted with the children to gain insight into their language background. These revealed that 20 children (80%) exclusively spoke Dhivehi with their parents and other adult relatives, while three children spoke both Dhivehi and English at home. Five children also spoke Indian languages in addition to Dhivehi and English; two children spoke Malayalam, and three children claimed to know some Hindi due to television. While language use with adult family members was largely restricted to Dhivehi, the language choice with siblings and friends was more varied. Almost half of the children spoke English with their siblings at least some of the time, while the other half exclusively spoke Dhivehi with them.

With friends, more than half used both Dhivehi and English, while 32% claimed to use only Dhivehi and 16% only English.

Furthermore, children were asked in which language they talk to themselves; 60% answered Dhivehi, 20% English, 16% both English and Dhivehi, and 4% Malayalam. When asked about reading activities outside of school, 28% claimed to read books in Dhivehi, 32% in English, and 32% in both languages. Only two children said they did not read. As for television, 48% claimed to watch mostly English programmes, 20% mostly Dhivehi, 16% watched television in both languages, and 16% in a third language (Hindi or Malayalam).

Materials

Participants were assessed with standardized language and reading tests in English, a mathematics tests and a nonverbal intelligence test, which are described in more detail below.

English Language Skills

The Word Finding Vocabulary Test of the Renfrew Language Scales (Renfrew, 1998) was used to assess productive vocabulary skills in English. In this task children were presented with 50 images of objects which they had to name. In order to have a measure of morphosyntactic abilities, we administered the word structure test of the Clinical Evaluation of Language Fundamentals in English (Wiig et al., 2013). In this task, consisting of 32 items, the child sees pictures and is asked to finish sentences initiated by the experimenter, aiming to elicit a variety of morphosyntactic structures.

Reading

We used the York Assessment of Reading for Comprehension (YARC, Snowling et al., 2009) to assess reading abilities in English. The YARC assesses three components of reading ability: accuracy (decoding), fluency (reading speed) and text comprehension. Following the YARC guidelines, children completed a single-word reading test, and depending on their score, they were presented with two passages at the appropriate level, on the basis of which accuracy and

fluency scores could most reliably be computed. When children were assigned the passage for absolute beginners, we only measured their reading accuracy but not their fluency (as is outlined in the YARC manual). Comprehension questions were asked only if the child reached the minimum accuracy score that was required for the text. The reading tasks were scored on the basis of audio recordings.

Mathematics

To test mathematical abilities, we used an adaptation of the mathematics test used by Tsimpli et al. (2020) in India, which was administered to children between the ages of 8 and 15. This test included an assessment of basic numeracy skills measured through eight subtraction and four division questions from the ASER numeracy tool in English. The mathematical word problems were adapted from the Trends in International Mathematics and Science Study (TIMSS 2011, Mullis et al., 2012) for Grade 4. Adaptations were carried out to make word problems more appropriate for the children involved, by replacing English names with Indian names and by replacing items within the scenario to be more reflective of situations the children may have experienced.

In our version, adapted to the Maldivian context, we presented children with four subtraction problems, four division problems, and six word problems in which a mathematical problem was presented in a narrative format.

Nonverbal Reasoning

We administered Raven's Colored Progressive Matrices (CPM, Raven et al., 1998) to obtain a measure of nonverbal intelligence that is associated with literacy development (Vogelzang et al., 2022), which is crucial when interpreting the results of other tests in relation to the potential negative effect of English-medium instruction. The Raven's CPM is a 36-item test, in which participants are asked to select the missing piece in a geometric design, is widely used to assess (nonverbal) abstract reasoning in children. We compared the results against the norms developed for the Indian population (Raven's Educational CPM/ CVS (India), Raven, 2012).

Procedure

The reading tasks and the vocabulary test were administered individually, in a quiet room within the school. We also asked children questions about their language use in everyday life. The individual sessions were recorded and lasted approximately 30 minutes. The experimenters spoke English with the children.

The test assessing morphosyntactic abilities (CELF), the mathematics test, and the nonverbal intelligence test (Raven's CPM) were administered in class. For the CELF and Raven's task, the items were projected on a screen and children were asked to provide their responses on an answer sheet. The classroom tests lasted approximately 45 minutes.

Consent from parents was collected prior to investigation. The study was approved by the Ethics committee of the University of Milan-Bicocca and authorised by the school in the Maldives.

Analysis

We computed the mean number of items answered correctly on the morphosyntax test, the vocabulary test, the different components of the mathematics test, and the nonverbal intelligence test. As for reading, we computed individual reading ability scores according to the guidelines outlined in the YARC manual, as well as the number of correctly read words per 100 words as a measure of reading accuracy, number of words read per minute as a measure of reading speed, and total number of questions answered correctly as a measure of reading comprehension.

We then performed a correlational analysis on English language scores (vocabulary and morphosyntax), reading ability scores (accuracy, fluency and comprehension), mathematics scores (subtraction and word problems) and nonverbal reasoning. In order to test whether reading accuracy and mathematical word problem scores could be predicted based on English proficiency after taking into account the effect of nonverbal reasoning skills, we ran two stepwise linear regression models, using the *lm* function in *R* (R Core Team, 2019).

Results

English Language Skills

The mean score on the CELF Word Structure test was 15 out of 32 ($SD = 8.4$, Range = 3-32), indicating that there was a great variability among children with respect to their morphosyntactic skills in English; while some children performed at ceiling, others failed to give a correct response over 90% of the time.

The mean score on the Word Finding Vocabulary test was 25 out of 50 ($SD = 6$, Range = 17-35), corresponding to an average age-equivalent score of around 4 years and 6 months according to the UK standardisation of the Renfrew Language Scales for monolingual children (Renfrew, 1998). Note that this age-equivalent score is merely provided as a point of reference, but that it should be interpreted with caution, since standardisation took place with children in a different part of the world with different linguistic, cultural and socioeconomic backgrounds.

Reading

Two children had to be excluded from the reading analyses due to the insufficient quality of the recordings. Furthermore, one child was not able to read at all, so that testing was interrupted. This left us with 22 children in the analyses of the reading data (12 fifth graders and 10 sixth graders).

The mean number of words read on the single-word reading test was 35.5 out of 60 ($SD = 12.7$, Range = 6-50). Based on this test we selected the starting passage: three children were given the text for absolute beginners, two children read the Grade 1 passage, two children the Grade 2 passage, four children the Grade 3 passage, six children the Grade 4 passage, three children the Grade 5 passage and two children the Grade 6 passage. In terms of text reading accuracy (decoding skills), children read on average 88.6 out of 100 words correctly ($SD = 12.8$, Range = 66-98). The mean ability score of reading accuracy (i.e., the score that was computed using the YARC manual to obtain measure of reading skills that can be compared across grades) was 43 ($SD = 10$, Range = 22-57). Since three children were only able to read the beginner passage, for which reading speed cannot be computed, reading fluency scores are available for 19 children.

On average, these children read 73.2 words per minute ($SD = 24$, Range = 31-117). The mean ability score of reading fluency on the YARC was 58 ($SD = 16$, Range = 27-78).

Comprehension scores could only be computed for the 14 best readers, since accuracy scores were too low for the other eight children. The mean number of questions answered correctly was 5.4 out of 16 ($SD = 3.1$, Range = 1-12.5), with an average reading comprehension ability score of 44 ($SD = 9$, Range = 30-64).

Mathematics

On the subtraction items, the mean score was 2.5 ($SD = 1.6$, Range = 0-4) out of 4. While ten children (40%) managed to solve all four problems, there were also four children (16%) who scored 0. As for word problems, the mean score was 1.3 ($SD = 1.5$, Range = 0-4) out of 6, with 11 children (44%) not being able to solve any of the problems. None of the children could do division (all scored 0 out of 4)¹. The analysis from here will therefore focus on subtraction and word problems only.

Nonverbal Reasoning

The mean raw score on the Raven's task was 30 ($SD = 4$, Range = 23-36) out of 36, which corresponds to a standard score of 95-100 in the Indian standardisation, indicating normal nonverbal intelligence. There were no children who scored more than two standard deviations below the mean.

Correlational Analysis

We found a moderate positive correlation between vocabulary and grammar scores ($r = .565$, $p = .003$), indicating that children with greater English vocabularies also tended to have better knowledge of morphosyntactic structures in English. Furthermore, vocabulary knowledge was moderately associated with nonverbal reasoning ($r = .565$, $p = .006$).

¹ Note that division was also particularly difficult for Indian children in Tsimpli et al. (2020), on which our mathematics test was based. They found that in many schools, division with three-digit numbers had not been taught yet, which is also the case in our study, according to teachers.

With respect to reading abilities, there was a strong positive correlation between reading accuracy and reading fluency ($r = .886, p < .001$). Crucially, reading accuracy (but not reading fluency) was moderately correlated with vocabulary knowledge ($r = .489, p = .024$), as shown in Figure 1. Morphosyntactic skills, however, were not significantly correlated with any of the reading measures.

As for mathematics, performance on word problems was positively correlated with nonverbal reasoning skills ($r = .612, p = .002$), but also with vocabulary knowledge ($r = .513, p = .009$) and reading accuracy ($r = .444, p = .044$). Figure 2 illustrates the relationship between word problems and vocabulary scores, Figure 3 the relation between word problems and reading accuracy, and Figure 4 the relation between word problems and nonverbal reasoning. There were no significant correlations with subtraction problems.

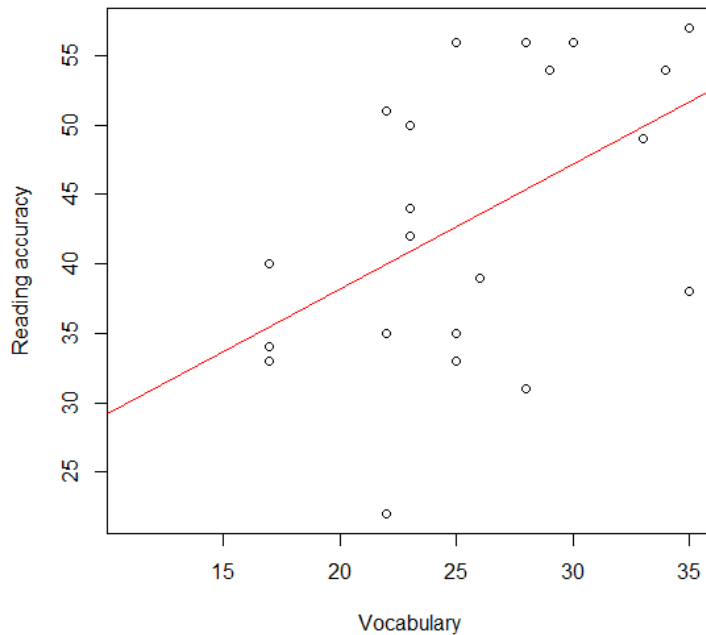


Figure 1. The relation between reading accuracy and vocabulary knowledge.

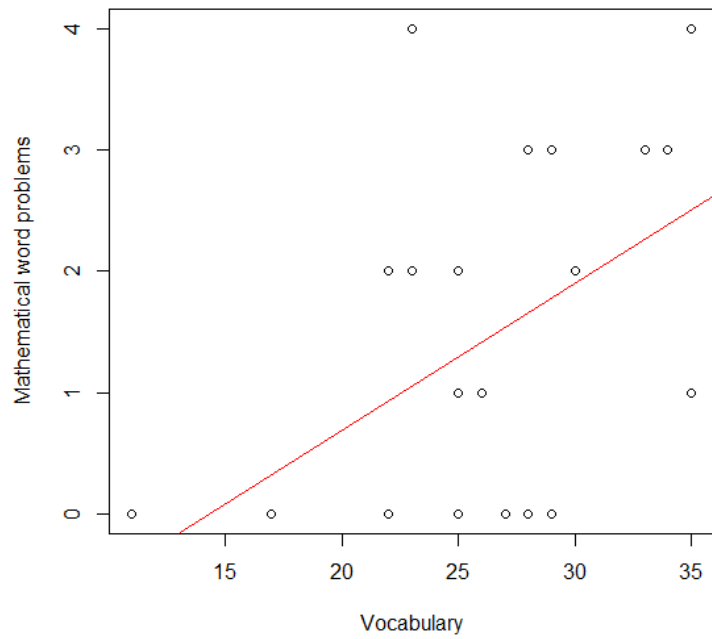


Figure 2. The relation between mathematical word problem scores and vocabulary knowledge.

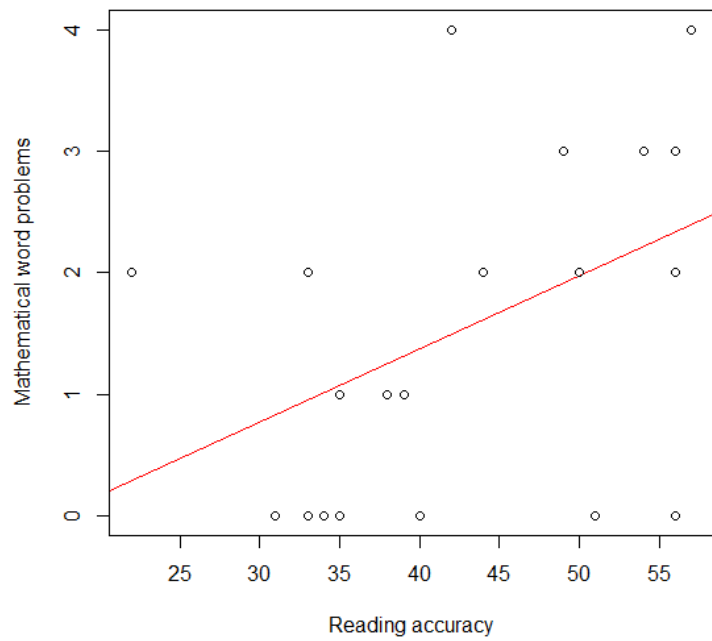


Figure 3. The relation between mathematical word problem scores and reading accuracy.

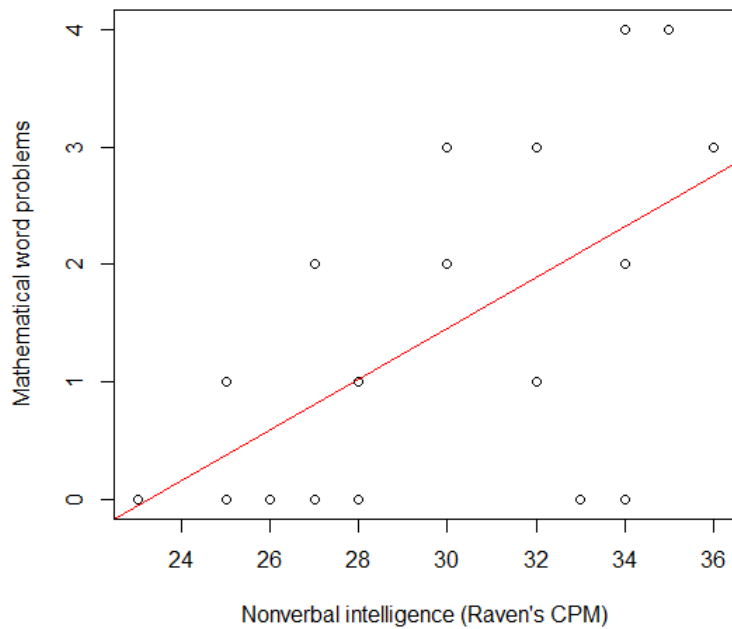


Figure 4. The relation between mathematical word problem scores and nonverbal intelligence.

Note that we also observed a trend for reading comprehension to be positively associated with mathematical word problems ($r = .465, p = .094$), nonverbal reasoning ($r = .517, p = .071$) and reading accuracy ($r = .448, p = .108$). The fact that these correlations were not significant may have been due to a lack of power, given that comprehension scores could only be computed for a smaller subgroup of children whose decoding abilities were sufficient. The full correlation matrix is provided in Appendix 1.

Regression Analysis

First, we looked at the effect of English vocabulary knowledge on reading accuracy. As there was no significant effect of nonverbal reasoning on reading accuracy scores, the best fit was obtained by including only vocabulary as a predictor of reading accuracy, $F(1,17) = 5.72, p = .029, R^2 = 25\%$. The regression coefficient indicated that a unit change in scores on the vocabulary task corresponded to a .932 point increase in reading accuracy ability scores (95% CI = .110 .. 1.75).

Furthermore, we aimed to model scores on mathematical word problems as a function of English vocabulary knowledge, reading accuracy ability scores and nonverbal reasoning. The best fit was obtained when only nonverbal reasoning scores were entered in the model, $F(1,20) = 10.42$, $p = .004$, $R^2 = 34\%$: there was no significant effect of vocabulary knowledge or reading accuracy once this factor was taken into account. A unit change in nonverbal reasoning scores was estimated to correspond to a .217 increase in scores on the mathematics word problem task (95% CI = .077.. .357).

Discussion

The present study investigated literacy skills and non-linguistic learning outcomes of 10- to 12-year-old children in a school in the Maldives, in relation to their L2 proficiency in English, the language which serves as the MoI in primary school. We hypothesized L2 submersion to be detrimental to learning, and we expected this to be reflected by the children's language, reading and mathematics scores, as well as by how these are interrelated.

Overall, our results showed relatively poor English language abilities and weak reading and mathematics skills, despite normal nonverbal intelligence. In terms of reading performance, we found very mixed results for decoding accuracy and speed, while reading comprehension was problematic for all children. This is in line with Benson's (2004) assertion that L2 submersive education may in some cases be successful in teaching children how to decode, while children may still fail to understand what they are reading. A similar pattern was observed by Vogelzang et al. (under review), who investigated literacy acquisition of disadvantaged primary school children in India.

Limited reading comprehension might at least partly be due to the way in which reading is taught in L2 submersion contexts. Using an ethnographic approach to study classroom practices in Maldivian secondary schools, Mariya (2012) observed that even though reading comprehension lessons were part of the curriculum, in practice these lessons consisted mostly of passive reading with little discussion of the questions or reflection on the texts. However, it should be noted that

reading comprehension also tends to be particularly challenging for children with a migration background in Western contexts who learn the majority language as an additional language (Burgoyne et al. 2009; Hutchinson et al. 2003).

Regarding the relation between reading and linguistic skills, we found that reading accuracy was positively related to English vocabulary knowledge, showing that children with a greater vocabulary in English were more successful in reading a text without errors. There was, however, no correlation between morphosyntactic skills and any of our reading measures. This type of correlation might be more likely to be observed when knowledge of the grammar of a language is relatively advanced; in such circumstances, we would expect that children with higher morphosyntactic competence have an advantage in their reading fluency and comprehension. We suspect that the lack of a correlation between reading and morphosyntax in our study is due to the fact that overall the English competence was poor and there were few children who had age appropriate reading scores.

With respect to mathematics, we found mixed performance on simple arithmetic problems (i.e., subtraction), while performance on math problems presented in a story was problematic across the board. Our results showed no correlations between scores on subtraction problems and language or reading abilities, while word problem solving skills were positively correlated with both English vocabulary knowledge and reading accuracy. This suggests that when trying to solve math problems in a narrative format, children may have been hindered by their insufficient knowledge of the language in which these problems were presented, rather than having difficulties with the mathematical operations *per se*.

However, a regression analysis revealed that when nonverbal reasoning was included in the model, the effects of English vocabulary knowledge and reading accuracy on mathematical word problem scores were no longer significant. This may indicate that the ability to solve mathematical word problems and the ability to learn words in a second language are in fact both modulated by children's general intelligence. Alternatively, the non-significant result may also have been due to insufficient statistical power, since our sample size was relatively small. Future studies should include more participants in order to address this issue. This would also allow for

a closer examination of the potential role of reading comprehension in children's understanding of mathematical problems that involve language.

A similar discrepancy between word-based and wordless math problems was found in learners of English as an additional language in the UK by Trakulphadetkrai et al. (2017). While they did not consider nonverbal intelligence, their results showed that 44% of the variance in word problem scores could be accounted for by children's reading comprehension skills. Word problem solving skills also correlated with general English language ability and working memory, but these effects were not significant once reading comprehension was taken into account. In the present study, we also observed a trend showing a positive association between reading comprehension and word problem solving skills, so this should be tested and further investigated by future studies conducted on a larger scale. It would be interesting to investigate whether teaching approaches that place a greater emphasis on reading comprehension may improve performance on word-based math problems.

For now, we will restrict ourselves to concluding that lexical knowledge of the language of instruction was related to children's reading accuracy, providing additional evidence for the interrelatedness between oral language and literacy development. A similar relationship between reading and vocabulary skills has been found in children who are taught in English in India (Treffers-Daller et al., 2022) and by studies focusing on immigrant students in Western contexts who are taught in the majority language (Bosch et al., 2021; Proctor et al., 2005; Verhoeven, 2000). In combination with previous research showing that children who are taught in their native language tend to have better general learning outcomes (Gopang et al., 2018; Heugh et al., 2007; Tsimpli et al., 2020) and an advantage in literacy acquisition (Aarts & Verhoeven, 1999; Verhoeven, 2000; Vogelzang et al., under review), our results emphasise the importance of teaching children in a language in which they are competent. Whilst there are many factors that may influence educational outcomes, such as teacher education and economic resources, the choice of MoI matters. It takes time before an L2 learner has reached the level that is required for academic purposes, and at least until that time, using the L1 in school is ideal. This has implications for policy makers in a wide range of settings where children are educated in a non-native language, including contexts in which children from immigrant families attend schools

that use the majority language. It also raises concerns regarding the global tendency towards English-medium instruction in non-Anglophone countries (Dearden, 2014), particularly in primary school.

Assuming that the native language is optimally suited for content learning and the early stages of literacy acquisition (Benson, 2004), we argue in favour of the preservation of the native language for primary education. That is not to say that Dhivehi should be the only MoI in the Maldives, since bilingual education may be a more suitable alternative in this specific context. Being proficient in English opens up opportunities in the Maldives, as all higher education is in English, and because tourism is the country's largest economic sector. Therefore, it is understandable that parents demand a large role of English in education, as was found by Mohamed (2013) and Shiuna and Sodiq (2013). It is also not surprising that parents tend to opt for full English-medium instruction when the alternative presented to them is monolingual education in Dhivehi. However, previous research has shown that when parents are asked to make a well-informed choice from a range of options, most of them choose bilingual education over full L2 immersion (Benson, 2004; Heugh, 2002). The implementation of bilingual English-Dhivehi programs may therefore be a viable solution, as it takes into account the importance of the native language for educational quality, as well as the need to learn English for pragmatic purposes.

The question, then, is what type of bilingual education would be most suitable for the Maldivian context. One option would be to implement a transitional model in which Dhivehi is gradually replaced by English. We can distinguish between early-exit models and late-exit models (Baker, 2001; Ramírez & Merino, 1990). In early-exit models the L1 is only used during the first years of education, while in late-exit models the L1 is used throughout primary school, with a gradual shift to the L2. Currently, the official policy in the Maldives is akin to a late-exit transitional model, while educational practice resembles a very early-exit transitional model, as the L1 is used only in preschool. It is common for post-colonial countries using a colonial language as the MoI to abandon the native language after only one or two years of education (Benson, 2009), but this is not enough to develop a strong foundation in literacy in the L1, nor does it give children the opportunity to learn the L2 sufficiently before it is used for instruction. Previous studies have

shown that late-exit transitional models lead to better educational outcomes than early-exit models (Akinnaso, 1993; Thomas & Collier, 2002), since positive transfer is only possible when children have a solid L1 competence. However, both types of transitional models have been classified as weak forms of bilingual education, since they promote subtractive bilingualism in which the goal is to eventually replace the L1 by the L2. In contrast, strong forms of bilingual education aim to foster additive bilingualism as well as biliteracy throughout the school years (Baker, 2001; García, 1996).

A preferable alternative would therefore be a truly bilingual system aiming at developmental maintenance of both Dhivehi and English. Not only does such a model make content learning more effective, but it also allows for continued development of the native language, which may in turn be beneficial for the acquisition of English as an L2. A communication-oriented bilingual approach would also have the potential to increase student-teacher interaction, leading to more effective learning. In addition, giving the native language a meaningful role in education may have positive effects on students' sense of identity, self-confidence and motivation (Baker, 2001; Benson, 2004; Salili & Tsui, 2005).

One should consider the practical challenges that a shift in MoI shift might pose for a small nation like the Maldives. Implementing mother tongue-based or bilingual education might require the development of new up-to-date teaching materials and exams in Dhivehi, as well as professional training of teachers. Yet, the fact that until only a few decades ago Dhivehi was used as the MoI demonstrates that it should be possible. Moreover, Dhivehi is a standardized language with a well-established writing system, which contributes to the feasibility of the implementation of such a shift.

We emphasize that the current study is a case study of a single school on a small island, and that the results can thus not be generalized to the Maldives as a whole. It should also be noted that the use of tests that were developed for Western countries in non-Western contexts such as the Maldives is not ideal. We fully acknowledge this, and we do not aim to compare the participants in this study to their age peers in Western countries. Furthermore, we are not able to make claims about the role of the native language, nor the role of biliteracy, in this specific group of children,

as we did not administer any tests in Dhivehi. Future studies, ideally conducted on a larger scale, should therefore also assess children's oral proficiency and literacy skills in their L1. Finally, it would be very interesting to investigate teachers' language proficiency in the MoI in relation to student achievement.

References

- Aarts, R. & Verhoeven. L. (1999). Literacy attainment in a second language submersion context. *Applied Psycholinguistics*, 20(3), 377-393. <https://doi.org/10.1017/s0142716499003033>
- Akinnaso, F. N. (1993). Policy and experiment in mother tongue literacy in Nigeria. *International review of Education*, 39(4), 255-285.
- Andrews, S. (2008). Lexical expertise and reading skill. In B. H. Ross (Ed.), *Psychology of learning and motivation: Advances in Research and Theory* (Vol. 49, pp. 247- 281). Elsevier. [https://doi.org/10.1016/s0079-7421\(08\)00007-8](https://doi.org/10.1016/s0079-7421(08)00007-8)
- Aturupane, H. & Shojo, M. (2012). *Enhancing the quality of education in the Maldives: Challenges and prospects* (No. 51). South Asia Human Development Sector. <http://hdl.handle.net/10986/17979>
- Baker, C. (2001). *Foundations of bilingual education and bilingualism* (3rd ed.). Multilingual Matters.
- Benson, C. (2004). *The importance of mother tongue-based schooling for educational quality*. EFA Global Monitoring Report 2005, The Quality Imperative, UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000146632>

- Benson, C. (2009). Designing effective schooling in multilingual contexts. In T. Skutnabb-Kangas (Ed.), *Social justice through multilingual education* (pp. 63-84). Multilingual Matters. <https://doi.org/10.21832/9781847691910-007>
- Bialystok, E., Luk, G., Peets, K.F. & Yang, S. (2010). Receptive vocabulary differences in monolingual and bilingual children. *Bilingualism: Language & Cognition*, 13(4), 525-531. <https://doi.org/10.1017/S1366728909990423>
- Bosch, J.E., Guasti, M.T., Arosio, F. & Foppolo, F. (2021, June 23-25). *The Relation Between Reading and Language in Multilingual and Monolingual Italian Children*. [Paper presentation]. Conference on Multilingualism, University of Konstanz.
- Burgoyne, K., Kelly, J. M., Whitely, H. E. & Spooner, A. (2009). The comprehension skills of children learning English as an additional language. *British Journal of Educational Psychology*, 79(4), 735-747. <https://doi.org/10.1348/000709909X422530>
- Maldives Constitution (2008). Comparative Constitutions Project. https://www.constituteproject.org/constitution/Maldives_2008.pdf?lang=en
- Cummins, J. (1979a). Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. *Working Papers on Bilingualism* 19, 121–129. <https://eric.ed.gov/?id=ED184334>
- Cummins, J. (1979b). Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research*, 49(2), 222-251. <https://doi.org/10.3102/00346543049002222>
- Cummins, J. (2000). *Language, power and pedagogy: Bilingual children in the crossfire*. Multilingual Matters. <https://doi.org/10.21832/9781853596773>.
- Dearden, J. (2014). *English as a medium of instruction: A growing global phenomenon*. British Council. <https://doi.org/10.13140/RG.2.2.12079.94888>.

Dutcher, N., & Tucker, G. R. (1996). *The use of first and second languages in education; a review of international experience*. The World Bank.

<https://documents1.worldbank.org/curated/en/131161468770987263/pdf/multipage.pdf>

Education Sector Analysis Maldives (2019). Policy planning and research division, Ministry of Education, Maldives. https://support.moe.gov.mv/wp-content/uploads/2020/05/EDUCATION-SECTOR-ANALYSIS_ESA.pdf

Fritz, S. (2002). *The Dhivehi language: A descriptive and historical grammar of Maldivian and its dialects*. Ergon-Verlag.

García, O. (1996). Bilingual education. In F. Coulmas (Ed.), *The Handbook of Sociolinguistics* (pp. 405-420). Blackwell.

Gopang, A. S., Parveen, S., & Chachar, Z. A. (2018). Determining the efficacy of mother tongue as medium of instruction at elementary level. *Grassroots*, 51(2), 207-219.

<https://prdb.pk/article/determining-the-efficacy-of-mother-tongue-asmedium-of-instr-5130>

Hakuta, K., Butler, Y. G. & Witt, D. (2000). *How long does it take English learners to attain proficiency?* (No. 1). The University of California Linguistic Minority Research Institute.

<https://eric.ed.gov/?id=ED443275>

Hanna, P. L. (2011). Gaining global perspective: Educational language policy and planning. *International Journal of Bilingual Education and Bilingualism*, 14(6), 733-749.

<https://doi.org/10.1080/13670050.2011.579949>

Heugh, K. (2002). The case against bilingual and multilingual education in South Africa: Laying bare the myths. *Perspectives in Education* 20(1), 171-196.

<https://hdl.handle.net/10520/EJC87116>

- Heugh, K., Benson, C., Bogale, B., & Yohannes, M. A. G. (2007). *Study on medium of instruction in primary schools in Ethiopia*. Ministry of Education, Ethiopia.
<http://hdl.handle.net/20.500.11910/6273>
- Hutchinson, J. M., Whiteley, H. E., Smith, C. D. & Connors, L. (2003). The developmental progression of comprehension-related skills in children learning EAL. *Journal of Research in Reading*, 26(1), 19–32. <https://doi.org/10.1111/1467-9817.261003>
- Maldives Bureau of Statistics (2021). *Maldives in figures; June 2021*.
<https://statisticsmaldives.gov.mv/maldives-in-figures-june-2021/>
- Mariya, M. (2012). *"I don't learn at school, so I take tuition": an ethnographic study of classroom practices and private tuition settings in the Maldives*. [Doctoral dissertation, Massey University]. <http://hdl.handle.net/10179/3962>
- Mohamed, N. (2013). The challenge of medium of instruction: A view from Maldivian schools. *Current Issues in Language Planning*, 14(1), 185-203.
<https://doi.org/10.1080/14664208.2013.789557>
- Mohamed, N. (2016). Language of instruction and the development of biliteracy skills in children: a case study of a pre-school in the Maldives. In V.A. Murphy & M. Evangelou (Eds.), *English for Speakers of Other Languages* (pp. 187-194). British Council.
- Mohamed, N. (2019). From a monolingual to a multilingual nation: Analysing the language education policy in the Maldives. In A. Kirkpatrick & A. J. Liddicoat (Eds.), *The Routledge international handbook of language education policy in Asia* (pp. 414-426). Routledge. <https://doi.org/10.4324/9781315666235>
- Mohamed, N. (2021). The agentive role of preschool leaders in language policy enactment: case studies of acceptance and resistance. *Current Issues in Language Planning*, 22(1-2), 225-242. <https://doi.org/10.1080/14664208.2019.1700057>

Mullis, I. V., Martin, M. O., Foy, P., & Arora, A. (2012). *TIMSS 2011 international results in mathematics*. International Association for the Evaluation of Educational Achievement.

National Institute of Education (2015). *The national curriculum framework*.

https://www.moe.gov.mv/assets/upload/National_Curriculum_Framework_English.pdf

Ouellette, G. P. (2006). What's meaning got to do with it: The role of vocabulary in word reading and reading comprehension. *Journal of Educational Psychology*, 98(3), 554–566.

<https://doi.org/10.1037/0022-0663.98.3.554>

Proctor, C. P., Carlo, M., August, D., & Snow, C. (2005). Native Spanish-speaking children reading in English: Toward a model of comprehension. *Journal of Educational Psychology*, 97(2), 246. <https://doi.org/10.1037/0022-0663.97.2.246>

Proctor, C. P., Harring, J. R., & Silverman, R. D. (2017). Linguistic interdependence between Spanish language and English language and reading: A longitudinal exploration from second through fifth grade. *Bilingual Research Journal*, 40(4), 372-391.

<https://doi.org/10.1080/15235882.2017.1383949>

R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing. <https://www.Rproject.org/>

Ramírez, J. D., & Merino, B. J. (1990). Bilingual education. In R. Jacobson & C. Faltis (Eds.), *Language distribution issues in bilingual schooling* (pp. 61-103). Multilingual Matters.

Rapatahana, V., & Bunce, P. (2012). *English language as hydra: Its impacts on non-English language cultures*. Multilingual Matters.

- Raven, J., Court, J. H. & Raven, J. C. (1998). *Raven manual, section 1 (General overview) and section 2 (Coloured Progressive Matrices)*. Oxford Psychologist Press.
https://doi.org/10.1007/978-1-4615-0153-4_11
- Raven, J. (2012). *Coloured Progressive Matrices and Crichton Vocabulary Scale: India edition*. India: Pearson.
- Renfrew, C. (1998). *The Renfrew Language Scales: Word finding vocabulary test*. Speechmark.
- Saeed, S., & Moreira, M. A. (2010). Learning from first time e-learning experiences for continuous professional development of school leaders in the Maldives: A case study. *Turkish Online Journal of Distance Education*, 11(4), 130-148.
<https://dergipark.org.tr/en/pub/tojde/issue/16910/176381>
- Salili, F., & Tsui, A. B. M. (2005). The effects of medium of instruction on students' motivation and learning. In R. Husain & F. Salili (Eds.), *Language in multicultural education* (pp. 135-156). Information Age Publishing.
- Shiuna, M., & Sodiq, A. (2013). Improving education in the Maldives: Stakeholder perspectives on the Maldives education. *International Journal of Small Economies*, 4(1), 23-38.
<http://ijse.maldivesresearch.org/journal-articles/135/>
- Sierens, S., Slembrouck, S., Van Gorp, K., Agirdag, O., & Van Avermaet, P. (2019). Linguistic interdependence of receptive vocabulary skills in emergent bilingual preschool children: Exploring a factor-dependent approach. *Applied Psycholinguistics*, 40(5), 1269-1297.
<https://doi.org/10.1017/s0142716419000250>
- Skutnabb-Kangas, T. (2000). *Linguistic genocide in education--or worldwide diversity and human rights?*. Routledge.

Skutnabb-Kangas, T. (2001). The globalisation of (educational) language rights. *International Review of Education*, 47(3-4), 201-219. <https://doi.org/10.1023/A:1017989407027>

Snowling, M. J., Stothard, S. E., Clarke, P., Bowyer-Crane, C., Harrington, A., Truelove, E., Nation, K. & Hulme, C. (2009). *York assessment of reading for comprehension passage reading*. GL Publishers.

The President's Office, Republic of the Maldives (2011, May 11). *President Ratifies National Language (Priority) Bill* [Press Release].
<https://presidency.gov.mv/Press/Article/5304#:~:text=The%20Act%20stipulates%20that%20all,who%20do%20not%20speak%20Dhivehi>.

Thomas, W. P., & Collier, V. P. (2002). *A national study of school effectiveness for language minority students' long-term academic achievement*. University of California, Berkeley: Center for Research on Education, Diversity and Excellence.
<https://escholarship.org/uc/item/65j213pt>

Trakulphadetkrai, N. V., Courtney, L., Clenton, J., Treffers-Daller, J. & Tsakalaki, A. (2017). The contribution of general language ability, reading comprehension and working memory to mathematics achievement among children with English as additional language (EAL): An exploratory study. *International Journal of Bilingual Education and Bilingualism*, 23(4), 473-487. <https://doi.org/10.1080/13670050.2017.1373742>

Treffers-Daller, J., L. Mukhopadhyay, A. Balasubramanian, V. Tamboli & I.M. Tsimpli (2022). How Ready Are Indian Primary School Children for English Medium Instruction? An Analysis of the Relationship between the Reading Skills of Low-SES Children, Their Oral Vocabulary and English Input in the Classroom in Government Schools in India, *Applied Linguistics*, 2022; <https://doi.org/10.1093/applin/amac003>

Tsimpli, I. M., A. Balasubramanian, T. Marinis, M. Panda, L. Mukhopadhyay, S. Alladi, & Treffers-Daller, J. (2020). *Research Report of a Four-Year Study of Multilingualism, Literacy,*

Numeracy and Cognition in Delhi, Hyderabad and Patna. The British Council.

https://www.britishcouncil.in/sites/default/files/multilila_project_overview_report_final_-_web.pdf

Tung, P., Lam, R., & Tsang, W. K. (1997). English as a medium of instruction in post-1997 Hong Kong: What students, teachers, and parents think. *Journal of Pragmatics*, 28(4), 441-459. [https://doi.org/10.1016/S0378-2166\(97\)00034-9](https://doi.org/10.1016/S0378-2166(97)00034-9)

UNICEF Maldives & National Bureau of Statistics (2018). *Children in Maldives: Analysis of children of the Maldives from Census 2014.*
<https://www.unicef.org/maldives/reports/children-maldives-2018>

Verhoeven, L. (2000). Components in early second language reading and spelling. *Scientific Studies of Reading*, 4(4), 313-330. https://doi.org/10.1207/S1532799XSSR0404_4

Vogelzang, M., I.M. Tsimpli and M. Panda. (2022). How Cognitive Abilities May Support Children's Bilingual Literacy Development in a Multilingual Society. *Languages* 7: 33. <https://doi.org/10.3390/languages7010033>

Vogelzang, M., A. Balasubramanian, I.M. Tsimpli, M. Panda, S. Alladi, A. Reddy, L. Mukhopadhyay, J. Treffers-Daller & Marinis, T. (under review). Multilingualism and Multiliteracy: Examining reading skills and reading comprehension in Indian primary education.

Wiig, E. H., Semel, E. & Secord, W. A. (2013). *Clinical evaluation of language fundamentals* (5th Ed.) (*CELF-5*). NCS Pearson.

Yamada, S., Fujikawa, K., & Pangeni, K. P. (2015). Islanders' educational choice: Determinants of the students' performance in the Cambridge International Certificate Exams in the Republic of Maldives. *International Journal of Educational Development*, 41, 60-69. <https://doi.org/10.1016/j.ijedudev.2015.01.001>

Appendix 1

Table 1 Pearson correlations between scores on language, reading, mathematics and nonverbal reasoning tasks.

	Nonverbal reasoning	Math: word problems	Math: subtraction	Reading comprehension	Reading fluency	Reading accuracy	Morpho-syntax	Vocabulary
Vocabulary								1
Morpho-syntax							1	
Reading accuracy						1		
Reading fluency					1			
Reading comprehension				1				
Math: subtraction			1					
Math: word problems		1						
Nonverbal reasoning	1							
	$r(21) = .556, p = .006^{**}$	$r(23) = .513, p = .009^{**}$	$r(23) = -.135, p = .519$	$r(12) = .134, p = .134$	$R(17) = .267, p = .268$	$r(19) = .489, p = .024^*$	$r(23) = .565, p = .003^{**}$	
	$r(21) = .312, p = .148$	$r(23) = .060, p = .776$	$r(23) = -.225, p = .279$	$r(12) = -.018, p = .951$	$r(17) = .017, p = .945$	$r(19) = .352, p = .118$		
	$r(19) = .408, p = .074$	$r(19) = .444, p = .044^*$	$r(19) = -.153, p = .507$	$r(12) = .448, p = .108$	$r(17) = .886, p < .001^{***}$			
	$r(17) = .073, p = .772$	$r(17) = .271, p = .263$	$r(17) = .063, p = .798$	$r(12) = .316, p = .271$	1			
	$r(12) = .517, p = .071$	$r(12) = .465, p = .094$	$r(12) = -.192, p = .512$					
	$r(21) = -.145, p = .509$	$r(23) = -.022, p = .917$						
	$r(21) = .612, p = .002^{**}$							

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