

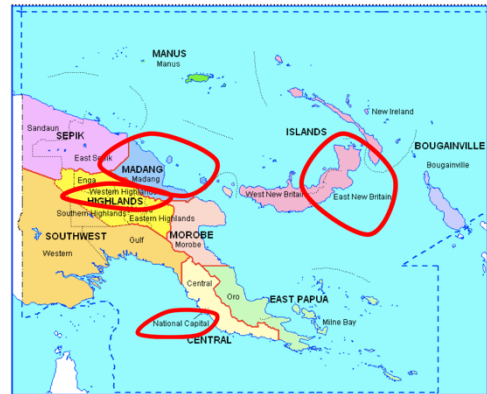
Vernacular-first versus English-only bilingual education: the EGRA studies

Robert Petterson, 2021

Handout for slide presentation

(1-2) From 2011 to 2013 the National Department of Education with support from The World Bank carried out literacy surveys of 5,500 school elementary and primary school children in four provinces of Papua New Guinea, as part of the Read-PNG project. This project was a huge 19.2 million USD investment in education in this country, so it is worthwhile paying attention to what they have found out. (The project also included some remedial programs.)

(3-4) The provinces surveyed were Madang (MAD), the National Capital District (NCD), East New Britain (ENB), and the Western Highlands Province (WHP), and an extensive report was published for each survey (The World Bank, 2014a-d), but as there was no overall comparative study published, this paper seeks to fill the gap.



(5) The survey instrument used was called Early Grade Reading Assessment (EGRA), an instrument that has been used to assess education in many countries around the world. It was designed by RTI International, a non-profit research organisation (see RTI International, 2015). In PNG the EGRA assessments included a battery of 9 tests that covered the first three states of literacy - Emergent Literacy, Decoding, and Confirmation and Fluency (see Dubeck & Gove, 2015).

(6) The tests assessed these literacy skills:

- (1) Listening Comprehension (they answer questions about a story told to them)
- (2) Phonemic Awareness (they identify the first sound of some spoken words)
- (3) English Letter Names (e.g. y is called [wai])
- (4) Letter sounds (e.g. y often has the sound [j] in the International Phonetic Alphabet)
- (5) Invented word reading (e.g. speng, vock)
- (6) Familiar word reading (e.g. spin, rock)
- (7) Reading fluency (they read as much as they can of a story in a set time)
- (8) Reading comprehension (they answer questions on what they have read)
- (9) Dictation (they write down a story as it is told to them).

Assessors gave 20 minute interviews with each individual student.

(7-8) Table 1. Details of the four EGRA surveys:

Province	Schools	Students	Grades	Survey date
Madang (MAD)	20	1,279	E2, P3, P4	Oct 2011
National Capital District (NCD) †	20	1,266	E2, P3, P4	May 2012
East New Britain (ENB)	41	1,696	E1, E2, P3, P4	Oct 2012
Western Highlands (WHP)	40	1,323	E2, P3, P4	May 2013

(In total 5,564 students were assessed in 121 schools; 400-450 children in each grade in each province.)

Elementary grade 1 (E1) was surveyed only in ENB, as the children had learnt to read in the Kuanua vernacular, and were becoming literate. In MAD, NCD, WHP, however,

testing started in grade 2 (E2), as most of the schools there were teaching only in English, and too many of the E1 children had literacy levels well below the level of the testing. They were teaching in English there, well before the change in language policy introduced in 2013 (Marape, 2013).

(9) Figure 1 summarises the literacy progress in each province, as shown by the aggregated test result averages. Note that ENB surpassed all the other provinces, and WHP did worst.

(10-18) All provinces did equally well for letter naming, but otherwise ENB had by far the best results for E1 and E2, and also for P3 and P4 for 7 out of 9 skills. The only skill where there was a notable dip for ENB was English Listening Comprehension during P3, when children were being bridged to English.

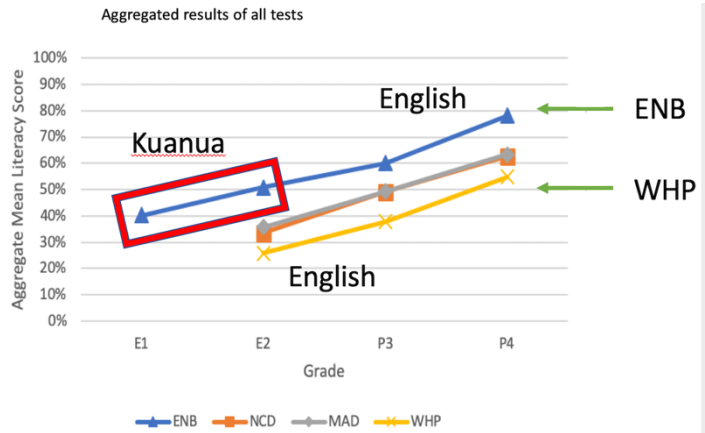
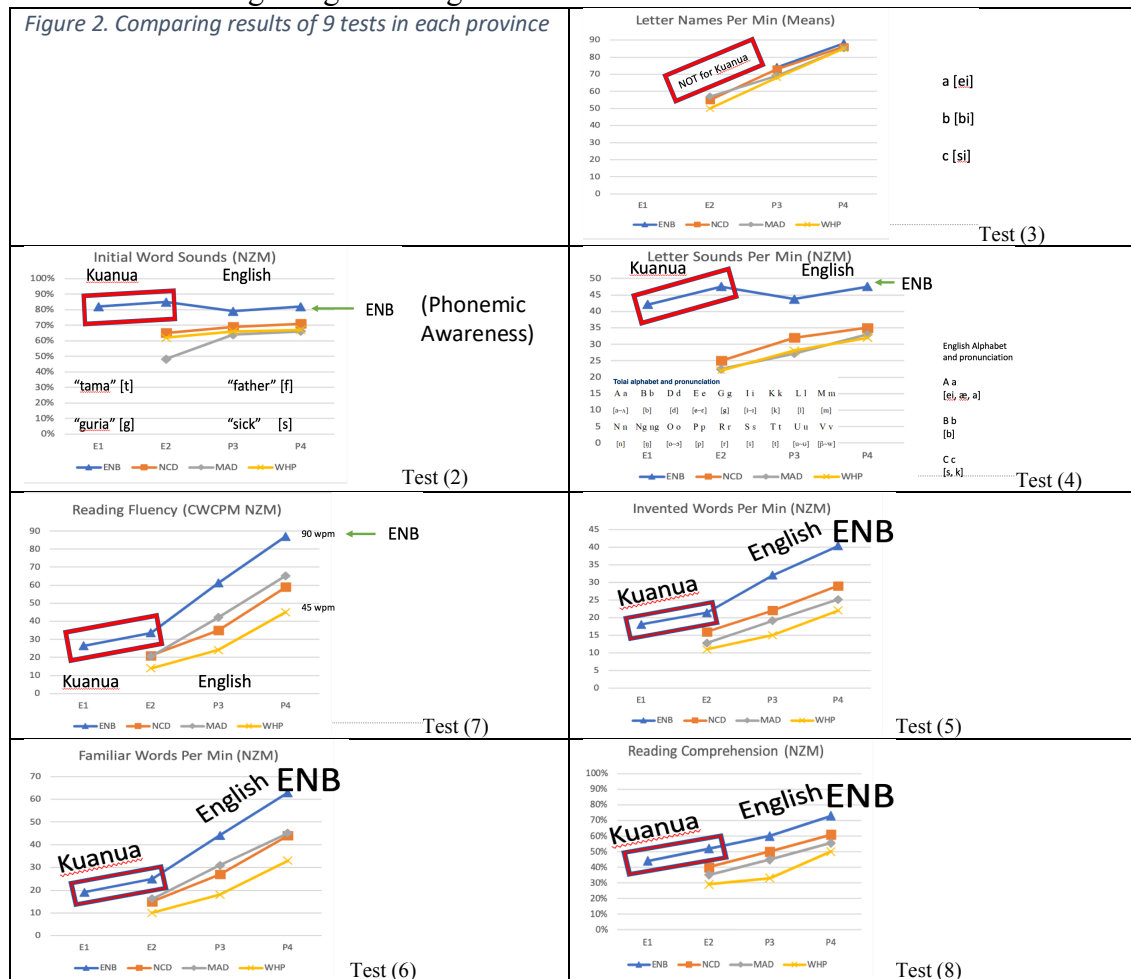
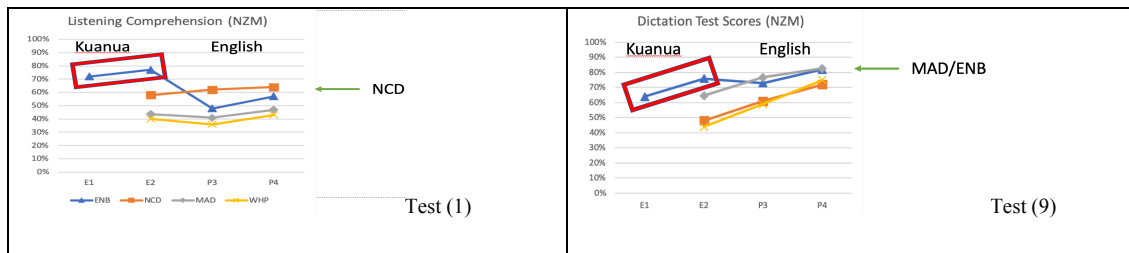


Figure 1. Summary of literacy progress E1-P4, in each province





(19-22) The proportion of zero scorers in a test is like a measure of difficulty that the teachers are having in teaching a particular skill. Only letter naming was universally easy.

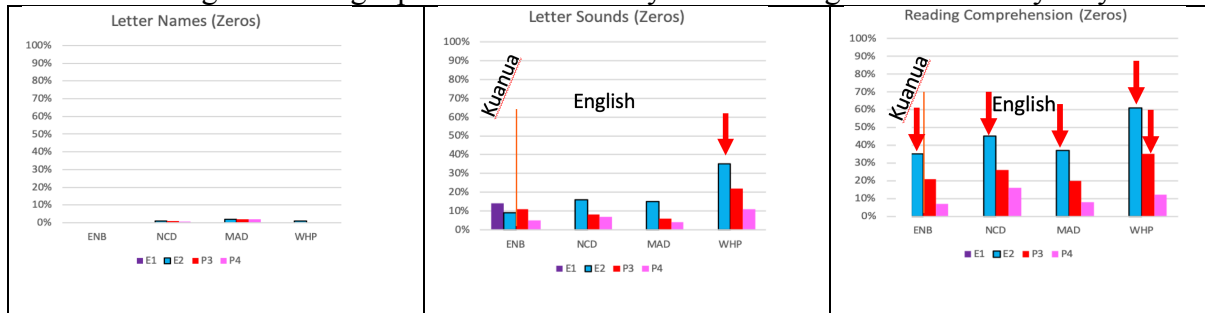


Figure 3. Zero scorer proportions for three example tests. Red arrows mark grades with >30% zero-scoring.

(23) I counted the number of times a test had more than 30% zero scorers. The results are shown in Figure 4. ENB had this level of difficulty only in grade 2 of reading comprehension (in Kuanua at that stage). (The other three provinces had more zero scorers than ENB for the same test.)

Number of grades (2-3-4) with >30% zero scorers - by province

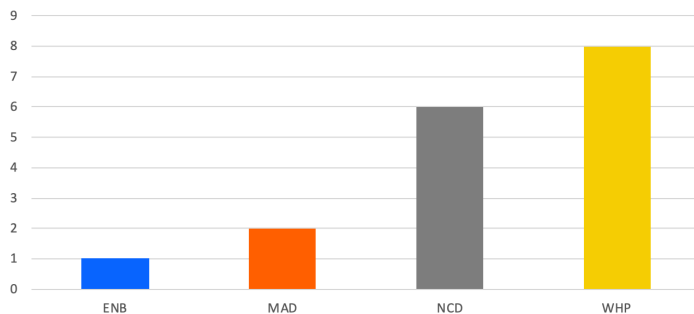


Figure 4. Number of grades with more than 30% zero scorers in any test, by province

(24) Statistical significance was indicated in the reports by using 95% confidence intervals. An example is shown in Figure 5 where the confidence intervals are shown by the I-bars at the top of the columns. (Non-overlapping I-bars shows a significant difference.)

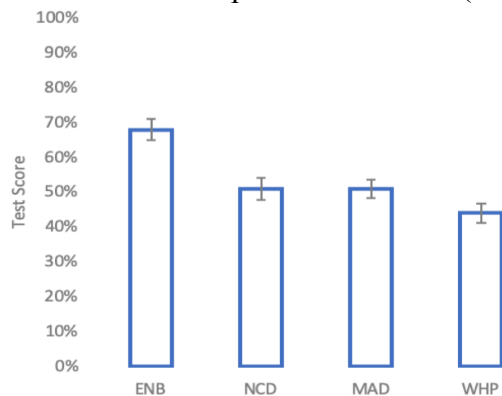


Figure 5. Mean scores and confidence intervals for reading comprehension test.

“Determining whether confidence intervals overlap is an overly conservative approach for identifying significant differences between groups. It’s true that when confidence intervals don’t overlap, the difference between groups is statistically significant. However, when there is some overlap, the difference might still be significant.”
<https://statisticsbyjim.com/hypothesis-testing/confidence-intervals-compare-means/>

(25-26) Read-PNG also explored possible causal factors to do with the student, teacher, or classroom which might be significantly associated with successful or unsuccessful literacy skill acquisition. They performed mostly ordinary least squares or Tobit regression calculations (and a few t-tests) on these factors for high level literacy skills. I collated the statistically significant regression coefficients for the factors which were significant for reading fluency, reading comprehension and dictation, and averaged and ranked them.

(27) The factors helpful for Kuanua (vernacular) literacy are shown in Figure 6.

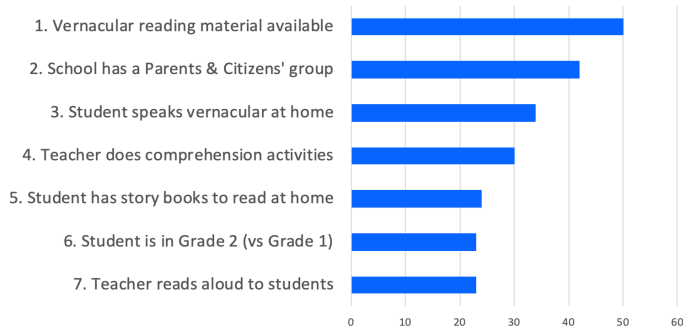


Figure 6. Ranked means of significant regression coefficients (%) for factors associated positively with high level vernacular literacy skills.

(28) The factors helpful for English literacy following vernacular literacy (ENB) are shown in Figure 7.

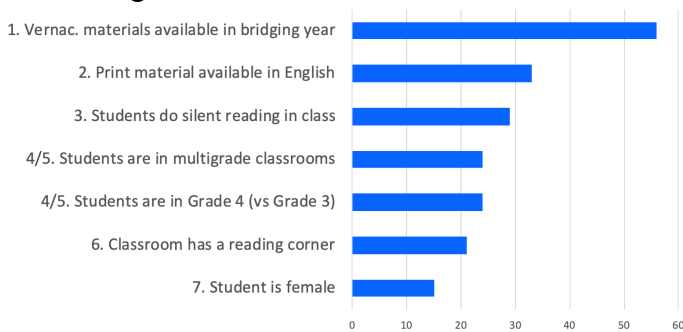


Figure 7. Ranked means of significant regression coefficients (%) for factors associated positively with high-level English literacy skills (after vernacular literacy).

(29) The factors helpful for English literacy under a predominantly English-only policy (MAD, NCD, WHP) are shown in Figure 8.

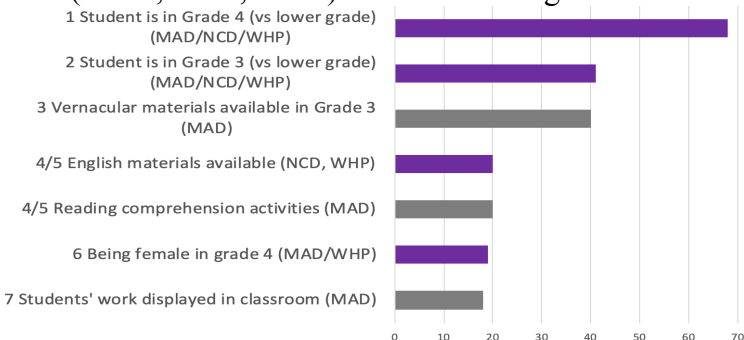


Figure 8. Ranked means of significant regression coefficients (%) for factors associated positively with English literacy (English-only policy). Grey bars show Madang-only figures, purple show figures significant in more than one province.

Note that some schools in MAD must have been teaching vernacular literacy in elementary school, in spite of it no longer being an official policy there since 2009. In those cases, the use of the vernacular materials during bridging was twice as helpful as the use of English materials!

(30) Some factors proved to have a negative association with English literacy. These are shown in Figure 9. Note that most of them are “counter-intuitive”.

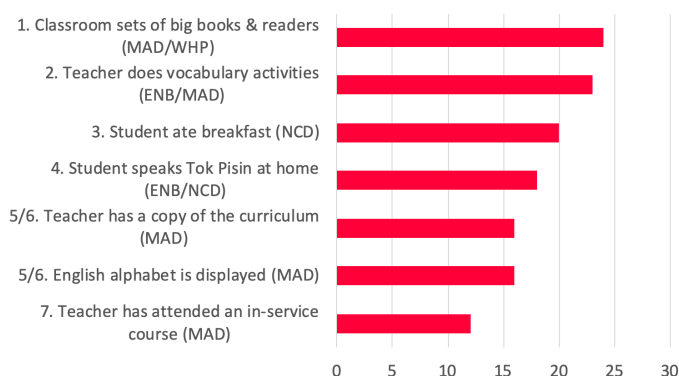


Figure 9. Ranked means of significant regression coefficients for factors associated negatively with acquisition of high level literacy skills.

(31-33) The researchers themselves warn that such counter-intuitive results – especially the use and availability of materials in English and in-service courses – “may have its [sic] basis in factors that could not be controlled for in the survey, namely socio-economic factors, rural/urban factors and so on” (The World Bank, 2014d, p. 40). (My own observations in the Gulf Province are that where English literacy is pushed early onto non-English speaking children, they are mostly not able to read at all in Grade 3, and some cannot still cannot read as late as Grade (Pettersen, 2013, p. 31).) Effectiveness and appropriateness of training is also discussed (ibid., pp. 7, 13, 17, ...).

I suggest that dietary factors should also be investigated, particularly the effect of a diet of refined food (with a high glycemic index) in the capital city, and iodine deficiency in the highland areas where there is no good access to sea-food, as “even mild iodine deficiency in pregnancy may lead to poorer cognitive outcomes in children, thus impairing their learning capacity...” (Goris et al., 2018).

(34) In conclusion, these results strongly indicate that:

(a) When English literacy is pushed too hard and too early on children who do not speak English, it has the effect of slowing down the acquisition of the very thing being pushed!

(b) When literacy is taught in the language spoken by the child, they acquire it easily, and those same skills are transferred when they move on to learning English literacy skills.

(c) Once vernacular literacy has been taught, bridging to English literacy is better if vernacular literacy continues to be used during the bridging year.

(d) The only disadvantage to teaching vernacular literacy is a delay in acquiring English listening skills. But the advantages of better text literacy surely outweigh that disadvantage, especially as the trend shows that they catch up quickly in those listening skills.

(e) Appropriateness of training needs to be studied, especially by trainers – they need to follow up what teachers do with their training, and whether school students do better or worse as a result of that training.

(f) Finally, the counter-intuitive results sometimes seen indicate that any study of education in a place of such diversity needs to take into account factors associated with that diversity, such as socio-economics, remoteness, and even diet.

This handout is a condensation of a detailed (39-page) comparative analysis (Petterson, 2021) which is being prepared for publication.

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