

The effects of immersion on Grade 7 learners' vocabulary size: Is incidental learning of vocabulary enough?

A B S T R A C T Immersion creates more opportunities for learners to activate their language learning abilities than any other teaching methodology. Research has shown that vocabulary in the language of learning and teaching is an important component of overall language proficiency, playing a crucial role in reading and academic success, whether students are studying through their mother tongue or not. The study described in this article compared the language proficiency of Grade 7 English second-language immersion learners with that of their English mother tongue classmates, focusing primarily on receptive vocabulary. Two aspects of immersion were identified: *length* and *quality*, i.e. richness. It was assumed that the longer the immersion, and the richer the immersion environment, the more positive the effect on vocabulary size would be. Results showed that length had a slightly stronger effect on receptive vocabulary size than quality, though both were generally positive. Implications of these findings for the classroom are discussed.

Keywords: Vocabulary size; immersion; deep immersion; shallow immersion; Model C schools; primary school learners; high frequency vocabulary; low frequency vocabulary; receptive vocabulary; productive vocabulary; second-language learners.

1. Introduction

This study considered the effects of a South African school immersion context on vocabulary size. Immersion is generally defined as a type of bilingual education in which a second language (or languages) is used together with student's native language as a medium of instruction during some part of their primary or secondary education (Genesee, 1983).

School immersion programmes originated in Canada in the sixties and the original programmes were based on the assumption that second-language acquisition would occur faster and more easily if the learner was placed within the target language environment and culture (Cohen, 1994). For this reason, immersion programmes were designed to create native-like learning conditions by increasing the period of time in which learners were exposed to the target language, while at the same time exposing them to the culture of speakers of this language. The aim of these programmes was to develop functional competence in the second language, while maintaining and developing normal levels of first-language competence. The major goal was the promotion of fluent oral communication skills but these programmes also strove to foster academic achievement consistent with the learner's academic ability and education level. What was innovative about immersion was that the target language was used to teach academic subjects. The rationale was that by learning through another language, children would learn this target language for the same reasons they acquired their first language: to communicate. Results from research studies have also suggested that bilingualism may have cognitive and linguistic advantages (Cummins, 1976; Lambert, 1962, in Genesee, 1998), and that immersion does not have a negative influence on native language development or academic achievement (Genesee, 1998). Important sociocultural aspects of the original Canadian immersion programmes included the fact that immersion programmes were initially intended for children who spoke the majority-group language, and there was implicit support for and value given to their first language (L1) and culture, both at school and at home, while acquisition of the second language (L2) was regarded very positively by both learners and parents.

Today immersion programmes exist all over the world and the term has taken on many aspects and interpretations: attempts to foster additive bilingualism have become a common phenomenon (Obadia, 1998: 81). This growth in immersion as a viable method of teaching a second or third language has been encouraged by, among other factors, globalisation and the desire among many language groups to be taught through a world language such as English or French. Various types of immersion programmes have developed since the mid-twentieth century. These include the European schools (Beardsmore, 1995), the Luxembourg school system and the German-French bilingual schools (Wode, 1995: 10). Increasingly, immersion programmes which promote minor languages such as Catalan (Querol, 1998), Basque (Wode, 1995) and Welsh (Beaudoin *et al.*, 1981; Lebrun and Beardsmore, 1993, in Wode 1995) have also been implemented. As far as immersion in South Africa is concerned, education policy has changed over the last few years and additive bilingualism is currently advocated in the interests of allowing all children access to meaningful education (Barkhuizen, 2002; Bloch, 1999; Granville *et al.*, 1998; Sarinjeive, 1999). This policy aims to promote the development and status of the historically disadvantaged African languages and to reduce the hegemony of English. The White Paper of 1999 on Language 'confirms the view that language diversity is a valued resource' and actively promotes functional multilingualism (De Klerk, 2000: 213).

In South Africa, the majority of L2 learners who study through the medium of English find themselves in an immersion situation. There are two kinds of immersion – rural and township schools, and suburban ex-'Model C' schools (for a fuller explanation of this term, see §1.2 below). Many children from the majority language groups find themselves in total immersion in a second or third language – or what Beardsmore (1995) calls submersion – from the very outset of their school careers, with their home language being accorded very little value, both inside

and outside school (De Klerk, 2000; Granville et al., 1998; Sarinjeive, 1999). This is particularly the case for those children who attend the former 'Model C' schools which were reserved for whites in the apartheid era. This situation could indeed be better termed submersion in that, initially at least, very little heed was paid to developing the learner's own language. In fact, it was often a case of subtractive rather than additive bilingualism, with punitive treatment meted out to children who spoke their own languages in the classroom, and even in the playground. Subtractive bilingualism occurs when home languages are not maintained and in the process are replaced by the language of learning and teaching (LOLT). In an environment that promotes additive bilingualism, on the other hand, students learn the additional language (AL) while their L1 is simultaneously encouraged or at least maintained (Smyth, 2002: 53-54) by being taught as a subject or, in some cases, being used as LOLT for some content subjects. As De Klerk (2000: 202) observes:

Most ...['Model C' schools] are multilingual and multicultural in composition but not in practice, and their ethos is western and white, with many of their educators (still predominantly English-speaking) firmly believing that educational success is only possible through mastery of English, which is seen as giving access to social and educational mobility and advancement to native and non-native users who possess it as a linguistic tool.

The Schleswig-Holstein immersion programme, upon which the study described in this article was loosely modelled, is an example of how immersion has been adapted to suit certain specific situations. This is discussed in more detail in the following section.

1.1 Schleswig-Holstein immersion programme

This is an immersion programme started by the government of Schleswig-Holstein in the early nineties in an attempt to 'make children better citizens of Europe' (Wode, 1995). As a result of the formation of the European Union and the subsequent opening of borders between countries in Europe, together with a relaxation in the controls which had previously existed on working in countries other than one's own, it was generally felt that people needed to be able to speak more than one, and preferably at least three, European languages.

Traditionally, language policies in Europe were monolingual. In contrast, the Schleswig-Holstein programme was designed to expose learners to a second and then a third language fairly early in their school career. English was first introduced as a subject in Grade 5 and then in Grade 7 certain subjects in the curriculum (history and geography) were taught through the medium of English.

Henning Wode (1995, 1998, 1999) and his colleagues at Kiel University were interested in how the relatively low doses of immersion in this programme would affect second-language development. To this end, they compared the vocabulary size of three groups of learners who had experienced varying degrees of immersion in English: learners exposed to minimal immersion by having history and geography taught through the medium of English, learners at the same school who had only encountered English as a subject, and those at another school which did not offer the immersion option and who had also encountered English only as a subject. The researchers included this third group because they suspected that the immersion school may

have attracted learners of a more academic bent and also those with parents who took a more active interest in their children's education.

This Kiel study, as it is referred to in this article, found that immersion learners generally used more English words, both *types* (number of different words or items in a text) and *tokens* (total number of words in a text, regardless of type, repetition etc.), in their writing and their speaking than those children who had not experienced the immersion classes. They also used more word types that did not appear in any of the materials used, and which the researchers then assumed could only have been picked up elsewhere. In the present study, these findings were extrapolated to hypothesise that we can predict an increase in vocabulary size according to the years spent in immersion, and the quality of that immersion experience. In the following section, the type of immersion dealt with in this study is discussed.

1.2 Immersion in South Africa

As has already been mentioned above (§1), the immersion situation in South Africa is very different from the one described in Wode's studies, and differs fairly radically too from immersion as it was first conceived in Canada in the early sixties. Most obviously, the original Canadian and the subsequent European and other immersion programmes were designed primarily for speakers of the majority language (in Canada, this was English) who were then immersed in a second and minority language (French, in the case of Canada). This is clearly a very different situation to the one existing in many South African schools today, where speakers of the majority languages (indigenous African languages) are immersed, in fact, submersed to varying degrees in a minority language of a minority culture, but one which carries social cachet and economic weight in this particular society.

There are basically two types of immersion in SA. Firstly, in the early nineties, with the approach of a democratic society and the relaxation of much of the restrictive apartheid legislation, black children were slowly admitted to schools which took the so-called C option of becoming integrated institutions. This name captured the public's imagination and even though the system is long since defunct, these schools are still commonly referred to as ex-'Model C' schools. These are schools which now have varying numbers of black pupils, but which to all intents and purposes have remained white in their culture and ethos and for the most part with very little recognition of the difficulties learners of different ethnic or language groups might experience. All children are taught through the medium of English (or, to a lesser extent, Afrikaans) and few schools still offer bridging classes or in fact any type of scaffolding at all. Perhaps this is no longer as necessary as it was in the early nineties when L2 learners were entering these schools as late in their careers as Grade 11 and 12. But even so, the situation at present is far from ideal and this study highlights the need for some form of language intervention if these learners are to develop their full potential. In contrast to most rural and township schools, which are generally poorly resourced and whose teachers are often not well qualified and where classrooms may be crammed with fifty or more learners, teachers at these ex-'Model C' schools are mostly well-qualified. But there is little extra L1 support from these teachers who, as predominantly white English or Afrikaans mother-tongue speakers, have little or no knowledge of the immersion learners' own languages, and until recently these learners were not encouraged to develop these languages further. In addition, although parents may

support the education their children are receiving, they themselves may not be equipped to provide the assistance in English at home which schools expect (Hofmeyr, 2000).

The second type of immersion in South Africa at present is that which exists in township and rural schools that introduce English as a subject in Grade 1 and are, nominally at least, English in medium usually from Grade 4. A feature of these schools is extensive code-switching and use of the mother tongue in all classes, including the language classes. Furthermore, the teachers at these schools are themselves usually not fluent in English and are ill-equipped to provide learners with the language skills they need to cope with learning through the medium of, and passing the matriculation examination in, English. Learners are hardly exposed to native speakers of English or to English print, other than in their textbooks, and English may be tantamount to a foreign language. Frequently, there are not enough textbooks to go round as classes are large, and there are few classroom or school resources. All this compounds the difficulties L2 learners may experience in learning the target language.

1.3 Why the focus on vocabulary size?

This study focused on the effects of immersion on one particular aspect of language acquisition: vocabulary. Vocabulary size is vital to success in reading. Research has shown the need for automaticity in a basic vocabulary of 2 000 to 3 000 word families (a word and all its derivatives and inflections) – about 5 000 lexical items or individual words – for general reading comprehension. This will allow the reader to cover 90% to 95% of the running words of a text (Nation, 1993).

According to Read (2000: 83), 'scholars work on the assumption that, in order to read independently, learners should know at least 95 per cent of the running words of a text. This means that only one word in 20 will be unfamiliar to them'. This supports the contention of both Nation (1990: 24) and Laufer (1992; 1997), that to achieve this kind of coverage, learners must have a vocabulary of at least 3000 word families. Such estimates of the vocabulary size of mother-tongue English speakers can be used as a benchmark for the acquisition of vocabulary of non-mother-tongue speakers who enter a school system which uses English as the LOLT.

Vocabulary is also a good predictor of reading success in second-language studies (Laufer, 1992). Laufer (1997) argues that the number of words in a reader's lexicon is the most important lexical factor in good reading. Academic ability does not make up for a lack of vocabulary: even good readers will not perform well in the second language if their vocabulary level is below the threshold of 3000 word families: Laufer's study with Hebrew and Arabic mother-tongue university students on the relationship between reading in an L2 and vocabulary size showed that the 'minimal number constituting the lexical threshold is 3 000' (Laufer, 1992: 129; Nation, 1993). Nation (1993) even suggests that it may actually be necessary to teach this basic high frequency vocabulary, while at the same time teaching learners strategies to cope with low frequency words in context as they are encountered.

Pretorius states that a 'lack of reading ability functions as a barrier to effective academic performance' (2002: 187). Although it must be kept in mind that language proficiency and reading, though clearly related, are 'conceptually and cognitively specific skills that develop in distinct ways and that rely on specific cognitive operations' (Pretorius, 2002: 175), if reading strategies are ineffective learners may find themselves reading at the frustration level (Lesiak

& Bradley-Johnson, 1983). The Threshold Report (Macdonald, 1990, in Pretorius, 2000) revealed that there was an immense gap between the words black South African children knew at the end of Grade 4 and those they needed to know to understand their Grade 5 textbooks. Cooper (1999), in her investigation of the vocabulary levels of first-year university students, found a relationship between vocabulary levels and academic performance: weaker students had smaller receptive vocabularies, and were particularly lacking in lower frequency words. In the case of L2 readers, there is evidence that reading problems in the L2 are caused fundamentally by their language deficit, especially by their lack of vocabulary (Alderson, 1984, in Laufer, 1997; Bossers, 1991, in Grabe & Stoller, 1997; Hacquebord, 1994). Without an adequate vocabulary these learners are unable to put into practice the reading skills they have already accomplished in their L1. This underlines the critical importance of developing an adequate high frequency vocabulary (2000 to 3000 word families, at least) in the L2 (Laufer, 1992, 1998; Nation, 1993).

The learners in the study described in this article were on the brink of high school where they would be faced with expository rather than narrative texts, and with subject-specific vocabulary. For this they would need an adequate vocabulary size, as discussed above. The study was conducted to examine the effects of different aspects of immersion on English second-language (ESL) learners' vocabulary size. The first three thousand levels of vocabulary were tested, i.e. the first 1000, second 1000 and third 1000 words levels (§ 2.3), in order to determine to what extent learners were developing a vocabulary large enough to cope with texts at high school level.

1.4 Aims of the study

As has been discussed, research has shown the importance of vocabulary, both basic and academic, to reading success. The focal point of this study was an examination of the difference in vocabulary size between immersion (IM) children who had entered ex-'Model C' schools at various stages of their school careers, and how their vocabulary compared in size to that of mother-tongue speakers of English in the same grade.

Two aspects of immersion were identified: *length*, which refers to the period spent in immersion; and *quality*, or the type of immersion environment of the learners. Each aspect consisted of two groups: in the length category there was *early immersion* (EI, four to seven or more years in immersion) and *late immersion* (LI, fewer than four years in immersion). Quality of immersion was categorised as *deep* (DI, School D) meaning a richer English environment, with more English being spoken among children because of the diverse nature of the pupil body, or *shallow* (SI, School S) because the majority of children spoke a Sotho language, with many still living in the townships.

Thus, though both schools were English medium ex-'Model C' schools, they had very different pupil populations: School D's Grade 7 group was made up at the time of data collection of about half mother-tongue speakers of English, and half speakers of other languages, with a fairly large group of foreign language speakers, this as the result of the school being in an area where many embassies are situated. School S's Grade 7s, on the other hand, were almost all black and speakers of an African language, with a few foreign language speakers. Foreign language speakers were subsequently omitted from the sample because the main aim of the study was to highlight the experience and reality of South African learners.

Grade 7 was chosen as the sample age group for two reasons: this was the age and education level focused on in the Kiel studies, thus providing a point of comparability with the present study; and secondly, in South Africa, this is the exit point from primary school and also the first year of the secondary phase of education (GETC). It is here that learners start to move into a more specialised and academic curriculum, and where they are exposed increasingly to the academic discourse of conceptually dense, subject-specific textbooks. The learners from the two ex-'Model C' Pretoria primary schools used in the study were combined to create the various groups.

Two research problems were identified:

How did the vocabulary size (in terms of the three different word levels) of the immersion groups compare to the vocabulary size of mother-tongue (MT) English speakers?

How did different kinds of immersion in English, namely length and quality, typical of certain types of primary schools in South Africa, affect the vocabulary size of L2 English learners?

An important issue to be clarified by this study was whether there was a gap between the immersion learners' vocabulary size and that of mother-tongue speakers of English who, it was presumed, would have enough vocabulary to cope with the textbooks they would be encountering in the high school classroom.

2. Methodology

2.1 Participants

Participants were drawn from the Grade 7 classes of two schools, referred to as School D and School S (§ 1.4). School D's Grade 7 group comprised 79 learners, while School S had 59 Grade 7 learners. The learners were aged between 12 and 14 years. Once foreign learners and those who had been absent for a phase of the testing had been excluded, 58 subjects from School D and 54 from School S remained. The home languages are indicated in the table below:

Table 1: Participants' home languages

		School D	School S	Total
Home language	English	29	0	29
	Tswana	7	26	33
	Southern Sotho	8	14	22
	Northern Sotho	2	7	9
	Zulu	8	1	9
	Xhosa	2	4	6
	Tsonga	1	2	3
	Swazi	1	0	1
	Total	58	54	112

2.2 Analytical framework: Receptive and productive vocabulary

The study categorised vocabulary into receptive and productive vocabulary, but focused primarily

on the former. Receptive vocabulary, also referred to in the literature as passive vocabulary, is what a learner needs to know about a word to understand it while reading or listening. Productive vocabulary, also known as active vocabulary, constitutes what a learner needs to know about a word in order to use it in speaking or writing.

This study measured learners' receptive (passive) vocabulary as well as, to a lesser extent, their productive or active vocabulary. Receptive tasks, such as reading, do not always require such specific knowledge of all lexical items involved, while productive knowledge demands a detailed understanding of both the denotative and the connotative meanings of words. Connotative knowledge allows the reader to make judgements about diction, register and so on, which is important for advanced language learners but may not be vital if the object of the reading exercise is to grasp the gist of an academic text (Crow, 1986). Receptive vocabulary usually precedes productive vocabulary. It is generally agreed that a passive vocabulary which is adequate for native-like reading fluency can never be entirely explicitly taught but must be acquired through extensive exposure.

This dichotomy between active and passive vocabulary could, however, be regarded as misleading as reading and listening are not passive modes at all. Readers participate actively in the reading process, for instance, by referring to background knowledge schemata and applying strategies in order to understand a passage. However, much more knowledge is needed for productive than for receptive language performance (Nation, 1990: 31).

2.3 Assessment material

A questionnaire was devised which every learner answered. This elicited information on languages spoken, to whom and when, learners' interests, schools attended, books read recently, and so on. This biographical data made it possible to place each learner in a specific category of deep or shallow immersion, early or late immersion, English mother-tongue or additional language speaker.

The vocabulary assessment comprised two main components: multiple-choice vocabulary tests to measure receptive (passive) vocabulary size, and a written exercise to measure productive (active) vocabulary size.

Two parallel vocabulary tests were designed specifically for this study, based on two chapters from a Grade 7 history textbook. These elicited data on receptive vocabulary size. Each test contained thirty questions, grouped into three levels: the first, second and third thousand-word levels. These levels were identified by a lexical analysis performed using the VocabProfile computer program. This is a freeware computer program developed by Nation (1990). The program analyses any text against three different word lists: Baselist 1 contains the 1000 most frequent words in English and Baselist 2 the second thousand most frequent. According to Nation (1990: 19), the words from these two lists account for around 87 per cent of the running words in a text. The third baselist is made up of Xue and Nation's University Word List (1984) which contains 836 word families which are particularly common in academic as opposed to general texts (i.e. words that typically occur in an academic context, sometimes referred to as 'subtechnical vocabulary', but referred to in this study as the 3000-word level). According to Nation (1990), the words from this category account for approximately eight

per cent of the running words in a university academic text, irrespective of the discipline from which it was taken.

The chapters from the history textbook were run through the Grammatik program on WordPerfect and both were found to have a Flesch Reading Ease Score (RES) of 69. This function in WordPerfect uses the Flesch Readability Index, which is a measurement of the ease with which a document can be read. Flesch readability indexes are also often translated into the educational level necessary to understand a document. A score of 69 corresponds with the Grade 7 level.

In order to ensure validity, Nation's Vocabulary Levels Test, or VLT (Nation, 1990), generally accepted as an appropriate measure of second-language (English) vocabulary size, was also used. This added to the richness of the data on receptive vocabulary size and acted as a benchmark for the other tests, as it is an internationally recognised test which is freely available to researchers. This test was devised for use by teachers who wished to develop suitable vocabulary learning and teaching programmes for their learners. It was designed specifically to establish where learners should be given help with vocabulary learning and has been widely used as a diagnostic vocabulary test for immigrant students when they arrive in an English-speaking country.

The VLT is made up of five sections comprising word-definition matching type items, each level representative of a different vocabulary level in English relating to specific vocabulary learning objectives, namely the 2000-word level, the 3000-word level, the 5000-word level, the university word level (UWL) and the 10 000-word level (see § 1.3).

One aspect of the study which was kept very similar to the German study was the writing exercise, used to elicit productive vocabulary. The same prompt was used as in the Kiel study (those researchers used it for both spoken discussions and for writing). The data came from a free writing exercise. Learners listened to a passage about a group of children who get into difficulties on a hiking trip. Certain problems arise and the learners were asked to provide solutions to these problems (Klippel, 1984). Learners were encouraged to write as much as they could in response to the questions and their writing was then transcribed and run through the VocabProfile program to establish the Lexical Frequency Profile (LFP).

2.4 Data collection procedures

A different procedure was followed at each school owing to the constraints placed on the data collection by the respective principals. At School D, data collection was done over two days, in the learners' English lessons. This meant that absenteeism was a factor and some learners had to be eliminated from the sample because they had missed a component of the testing process. At School S the teacher very cooperatively put all the Grade 7s in one room for the entire morning. This meant that all learners completed all phases of the process. It did mean, however, that by the end of the day there was some restiveness and fatigue.

Once the data collection process was complete, the tests were marked and the scores entered using the SPSS statistical software program. The writing was transcribed and these texts were analysed by VocabProfile to establish the LFP.

3. Results

The first aim of the study was to compare the vocabulary size (in terms of the three different

levels) of the immersion groups to that of mother-tongue (MT) English speakers. The second aim was to examine how different kinds of immersion in English, namely length and quality, typical of certain types of primary schools in South Africa, affected the vocabulary size of L2 English learners.

These results of Test A are reflected below in Table 2 and 3 respectively.

Table 2: Length of immersion: Vocabulary Test A

	Groups	N	Mean	sd
1000-word level	MT ¹	29	8.90	2.717
	EI ²	55	8.00	1.587
	LI ³	28	7.36	2.059
<i>F-value</i>	4.091			
<i>p-value</i>	.019*			
2000-word level	MT	29	9.03	1.636
	EI	55	8.02	1.381
	LI	28	6.93	1.864
<i>F-value</i>	12.670			
<i>p-value</i>	.000 ***			
3000-word level	MT	29	8.07	1.557
	EI	55	6.65	2.171
	LI	28	5.71	2.034
<i>F-value</i>	10.152			
<i>p-value</i>	.000 ***			

* = p . 0.05

** = p . 0.01

*** = p . 0.001

¹ MT: Mother-tongue speakers of English

² EI: Early immersion learners

³ LI: Late immersion learners

As can be seen from these results, the mother-tongue speakers of English (MT) performed better on each level of the vocabulary test than the immersion learners, both early and late. However, those learners who had experienced longer periods in immersion performed consistently better than the late immersion learners. An ANOVA was performed to determine whether these differences were significant. A *post hoc* Scheffé test showed significant differences between the MT group and both immersion groups at the 2000- and 3000-word levels: for example, between the MT and EI group in the 2000-word level, $p = 0.022$ and between the MT and LI groups, $p = .000$. At the 3000-word level, there was a significant difference between the MT and EI groups ($p = .010$) and between the MT and LI groups ($p = .000$).

Table 3: Quality of immersion: Vocabulary Test A

	Groups	N	Mean	sd
1000-word level	MT ¹	29	8.90	2.717
	DI ²	29	8.24	1.527
	SI ³	54	7.54	1.860
<i>F-value</i>	4.308			
<i>p-value</i>	.016*			
2000-word level	MT	29	9.03	1.636
	DI	29	8.34	1.261
	SI	54	7.28	1.698
<i>F-value</i>	12.535			
<i>p-value</i>	.000 ***			
3000-word level	MT	29	8.07	1.557
	DI	29	7.31	1.845
	SI	54	5.81	2.146
<i>F-value</i>	14.237			
<i>p-value</i>	.000 ***			

* = *p*. 0.05** = *p*. 0.01*** = *p*. 0.001¹ MT: Mother-tongue speakers of English² EI: Early immersion learners³ LI: Late immersion learners

A similar pattern emerged for the quality of immersion group, where MT learners once again outperformed the immersion learners. The DI learners in turn outperformed the SI learners, although a *post hoc* Scheffé test revealed no significant differences. A *post hoc* Scheffé test did show significant differences between the MT group and the SI immersion group at the 2000- ($p = .000$) and at the 3000-word levels ($p = .000$), however.

The tables here reflect only one section of the testing process, Vocabulary Test A. But overall, in the case of receptive vocabulary as measured by both vocabulary tests (Tests A and B) and the VLT, both length and quality of immersion had a significant effect on the size of vocabulary, with length exerting a marginally stronger influence: ANOVAs on the receptive vocabulary data revealed slightly more significant effects for the length of immersion variable in general (26 instances as opposed to 24 for the quality of immersion variable), and more very highly significant differences specifically (11 as opposed to nine).

Across both variables, differences were most pronounced when comparing the receptive vocabulary size of mother-tongue speakers of English to that of subjects who had the least experience of immersion (that is, late and shallow immersion subjects). While there were also some significant

differences within the immersion categories, these were very few: between EI and LI subjects (4) and between DI and SI subjects (4).

Productive vocabulary data were analysed as follows: as each subject wrote a different number of words, the number of types used from each of the word-levels was calculated as a percentage of the total number of word types in each subject's piece of writing. The mean of these percentages was then calculated to indicate the proportion of word types that each group had used from each of the three levels: 1000-, 2000- and 3000-word levels. The results are reflected in Tables 4 and 5 below.

Table 4: Length of immersion: productive vocabulary

	Groups	N	Mean	sd
1000-word level	MT	29	86.91	4.142
	EI	55	85.24	3.587
	LI	28	85.98	3.070
	Total	112	85.86	3.655
<i>F-value</i>	2.044			
<i>p-value</i>	.134			
2000-word level	MT	29	9.21	2.775
	EI	55	9.88	2.591
	LI	28	9.74	2.721
	Total	112	9.67	2.663
<i>F-value</i>	.610			
<i>p-value</i>	.545			
3000-word level	MT	29	.85	1.148
	EI	55	.95	.932
	LI	28	.70	.906
	Total	112	.86	.982
<i>F-value</i>	.565			
<i>p-value</i>	.570			

* = *p*. 0.05

** = *p*. 0.01

*** = *p*. 0.001

Across the three groups there was very little difference in the proportion of word types from each level used by learners in their writing, with the overwhelming majority of words used coming from the 1000-word level. A large proportion of words used by subjects across all groups in this study came from the 1000-word level, and this included the MT English speakers. As these learners were approaching high school, where they will encounter academic texts and will be expected to write more formally, this is a concern. These findings reflect those of Laufer (1995, in Laufer, 1998): better passive and controlled active vocabulary do not seem to be reflected in free production. Learners seem to have 'fossilised' their free vocabulary (beyond-

Table 5: Quality of immersion: Productive vocabulary

	Group	N	Mean	sd
1000-word level	MT	29	86.91	4.142
	DI	29	85.95	3.921
	SI	54	85.24	3.131
	Total	112	85.86	3.655
<i>F-value</i>	2.013			
<i>p-value</i>	0.139			
2000-word level	MT	29	9.21	2.775
	DI	29	9.39	2.824
	SI	54	10.07	2.499
	Total	112	9.67	2.663
<i>F-value</i>	1.206			
<i>p-value</i>	0.303			
3000-word level	MT	29	0.85	1.148
	DI	29	1.04	1.137
	SI	54	0.77	0.784
	Total	112	0.86	0.982
<i>F-value</i>	0.73			
<i>p-value</i>	0.484			

* = *p*. 0.05** = *p*. 0.01*** = *p*. 0.001

2000-words per composition), and do not progress even when their passive and controlled active vocabulary improves. Even though the receptive results showed significant differences between groups, these were not reflected in the learners' productive vocabulary. It is clear that learners will need to be pushed to produce more low frequency words to develop their productive vocabulary size.

4. Findings

4.1 Discussion of findings

Generally, the findings revealed, not unexpectedly, that with regard to receptive vocabulary, the MT group outperformed the L2 learners at all levels of the vocabulary tests; in addition, those learners who had experienced more or a richer type of immersion tended to outperform the late and shallow immersion learners.

More specifically, however, with regard to the length of immersion hypothesis, results suggested that neither early nor late immersion learners had as yet made the transition from basic to non-basic vocabulary which should occur at this level of cognitive and maturational development

and which Laufer (1992,1997) postulates as being important to becoming an independent reader: '... the turning point of vocabulary size for reading comprehension is about 3000 word families [...] the level at which good L1 readers can be expected to transfer their reading strategies to the L2 is 3000 word families, or about 5000 lexical items' (Laufer, 1997: 23-24). Results for the quality of immersion hypothesis, however, suggest that some deep immersion learners may already have begun to make this transition.

Differences between mother-tongue English speakers and early immersion learners' scores at the 1000-word level were not highly significant, but differences started emerging as the words became less frequent. This tendency was reflected in scores for mother-tongue English speakers and deep immersion learners. This may suggest that the early immersion learners, after a period of immersion of five or so years, and deep immersion learners who experienced a richer English environment, may have begun to build up a basic receptive vocabulary (that is, at the higher frequency levels at least: 1 000- and 2 000-word levels) which was almost commensurate with that of their mother-tongue English-speaking peers. However, the fact that the immersion learners showed a delay in the development of words from the 3000-word level is a cause for concern: a learner should be familiar with not only the 2000 high frequency words in the English language, but also with the general academic vocabulary common to many academic disciplines (Xue & Nation, 1984). But one thing seems clear: the longer the period of immersion and the richer the quality of the immersion environment, the larger the receptive vocabulary.

Results from the ANOVAs performed on the productive vocabulary scores were less clear cut. The data came from a free writing exercise (§ 2.3). No significant differences between totals of word types used were revealed at any of the three levels for either the length or the quality of immersion variable. A free writing exercise such as the one used may not have demanded that the learners used all the relevant vocabulary they knew: they were not forced to extend themselves and may have chosen safe options which they knew were correct, rather than opting for vocabulary that was risky and error-prone because it was less familiar. A controlled-active vocabulary exercise may have produced results that were more genuinely reflective of their productive vocabulary size, with regard to both the length and quality of immersion variables. Laufer (1994, 1998) showed that what she called free-controlled exercises elicited more low frequency words than free writing exercises. In free-controlled exercises learners are prompted to use particular words. In spite of participants in Laufer's studies increasing their passive vocabulary and making progress in controlled active vocabulary size, they did not put this knowledge to use when choosing their own vocabulary. In the study under discussion in this article, immersion learners' scores on Test A and B and the VLT and from the writing exercise revealed that although they were recognising words from lower frequency levels, they were not using these in their writing. Free active vocabulary seems to reach a 'plateau' beyond which it does not progress (Laufer, 1998: 266) and this was reflected in the results in this study. Corson (1997: 702), referring specifically to academic vocabulary, notes that although many new words may enter children's passive vocabularies as they read, only those that are encountered repeatedly will be learned in the sense that they are readily available for productive use.

In this regard, Swain (1996) argues that the type of processes involved in producing language are often very different from those involved in comprehending language. Because of this, learners need more opportunities for 'sustained oral use of the target language' (1998: 129) and she

refers to ongoing studies of Canadian immersion programmes which have revealed the efficacy of introducing the sort of tasks that encourage what she refers to as 'metatalk' (Swain, 1996: 131), the language that learners use to reflect on their own language use.

It can be claimed, then, that in these specific immersion contexts, neither length nor quality of immersion had any significant effect on productive vocabulary size. As has been posited above, immersion learners in particular will need to be made to focus on pushing their output beyond the more familiar, high frequency words if they are to reach a level of vocabulary knowledge at which they can cope adequately with the type of writing demanded at high school.

In the productive vocabulary test, all subjects used generally very low proportions of words from the levels above the 1000-word level. The results showed, too, that there was little difference between groups, immersion and English mother tongue. However, as far as variation of vocabulary and the use of words which had not come from the text was concerned, immersion subjects actually used more of these types than did MT English speakers, a finding which reflects those of the Kiel studies, where immersion subjects used more words which did not feature in any of the test materials than their non-immersion counterparts.

This study in part confirms the finding from the Kiel studies (e.g. Daniel & Nerlich, 1998; Kickler, 1995; Wode, 1998) that time in an immersion class, regardless of the quality of that immersion situation (those studies dealt with classes that were essentially foreign language classrooms and teachers who were not mother-tongue speakers of English) can produce positive results, although it is only the receptive data in the present study which clearly supports this. Daniel and Nerlich (1998) concluded that immersion learners in general could be assumed to have a larger vocabulary than non-immersion learners studying the target language as a school subject. The present study supports Wode's claim that 'IM [immersion] creates better opportunities for learners to activate their language-learning abilities than any other teaching methodology today' (1999: 256), while at the same time highlighting the need for a focus in the classroom on activities designed to develop vocabulary size, both receptive and productive.

4.2 Pedagogical implications

Although in many cases the differences between early and late or between deep and shallow immersion learners were not pronounced, what is clear is that there is a significant gap in vocabulary size between mother-tongue speakers of English and those learners who have experienced a shorter period or lesser degree of immersion. Something in the way of conscious intervention and scaffolding is necessary on the part of teachers if the vocabulary of these learners in immersion is to grow to a level at which they can easily access the academic textbooks they will encounter at high school. Genesee (1978, in Obadia, 1998) reports, for instance, that late immersion programmes have been found to be as successful in their results as early immersion programmes' success depends much of the time not on extent of exposure but on quality of teaching. Stevens (1983, in Genesee, 1998) compared the achievement in the L2 of a group of partial late immersion learners in Montreal with that of a teacher-centred, curriculum driven conventional total late immersion programme. She found that the two groups reached the same level of second-language proficiency, despite the fact that the former programme, which was student-centred, provided only half as much exposure to the target language. Both these studies underline the importance of teacher input and teaching method in immersion

programmes, and this is an area that requires investigation in current ex-'Model C' schools, as well as providing impetus for comparative research in township and rural schools. More serious attention should be given to both explicit vocabulary instruction as well as implicit vocabulary development. At present it seems that there is little recognition of the problems L2 learners in South African schools may have with English vocabulary and their need for support structures: they are simply expected to cope lexically. In the Schleswig-Holstein programme, for instance, booster periods were provided in addition to traditional English-as-subject lessons, in order to prepare learners better for immersion when it was introduced (Burmeister, 1998). Future studies could examine the feasibility of similar programmes in South African schools.

Explicit teaching of vocabulary might help to close the apparent gap in vocabulary size between English mother-tongue speakers and immersion learners, but this depends on whether this gap is merely an inadequate vocabulary size or whether it is a reflection of generally poor reading skills. Immersion learners may not have adequately developed their CALP (cognitive academic language proficiency) in their L1, which means they will have difficulty in transferring these skills to their L2. Further studies will need to investigate this possibility. If these immersion learners are entering an English-speaking environment later in their school career, are their reading skills in their L1 well enough developed to allow them to transfer CALP skills to the L2? Are learners who enter this system early being given the chance to develop CALP skills in their L1 at all? In either case, simply teaching vocabulary might not be enough.

Both basic and academic vocabulary is required to meet Laufer's (1992) vital requirement of 95 per cent of text coverage for comprehension. Given that some of the groups in this study performed very poorly at all levels of vocabulary, it seems that these learners do not even have an adequate knowledge of the most basic vocabulary (1000- and 2000-word levels), let alone the 3000-word level and above. It is imperative that they do progress towards this level though, as they are on the threshold of high school where texts become increasingly academic and subject-specific in their focus, and where they will need a thorough knowledge of at least the 2000 high frequency words as well as a developing knowledge of the UWL or 3000-word level to provide 90 to 95 per cent text coverage, allowing them to read to learn (Alderson, 1984, in Laufer, 1997; Cooper, 1999; Hacquebord, 1994; Laufer, 1992, 1997; Nation, 1990; Pretorius, 2000; Smyth, 2002). If this foundation is not firmly established by the end of the senior primary phase (i.e. Grade 7) then the gap will only widen as they progress through high school. This indicates a need for more research into the efficacy of vocabulary instruction, particularly of the basic levels of vocabulary, at primary school level.

4.3 Implications for further research

In this study attention was paid to explaining two central themes in bilingual vocabulary development, namely comparing the difference between MT and ESL learners in terms of three vocabulary levels, and then seeing what effects factors such as length and quality of immersion have on vocabulary development and performance.

The findings reveal that there is definitely scope for more research into both vocabulary development and instruction as well as the effects of immersion in South African schools. Follow-up research should look at the differences in immersion in ex-'Model C' schools and township and rural schools. These three categories would provide three very different scenarios.

Given the research into the importance of a vocabulary of adequate size to cope with academic texts, and given the results of this study, which show that immersion learners from relatively privileged and well-resourced schools have in most cases not built up a big enough vocabulary for successful academic study, there is certainly a case for far more research into methods of increasing vocabulary size in immersion classrooms in the South African context, especially in more disadvantaged schools where learning conditions are not ideal.

5. Conclusion

Although the researcher acknowledges that there are other perspectives such as genre theory and semiotics, this article considers language learning from a very specific angle. It is hoped that this study will raise awareness of the importance of vocabulary to reading and academic success, and the potential problems to which a lack of emphasis on the value of vocabulary could give rise. Laufer (1986: 69) makes the point that '[n]o language acquisition can take place without the acquisition of lexis'. She cites research which points to the fact that lexical problems may be even more important than those in phonology and syntax (Meara, 1984, in Laufer, 1986). So it is vital that learners on the brink of high school and the academic challenges it presents are equipped with a vocabulary that will allow them to access context-reduced academic texts. That vocabulary is a vital part of language knowledge has been clearly attested to. As Corson (1985: 3) puts it:

After the very earliest stages of schooling, when children have learnt to structure their language, the chief linguistic factor which influences the communication of meanings is the content of their language: the use of words. By their choice and use of words children can explain, describe, justify and impress with their display of knowledge. Language theorists in education have often overlooked a fact that experienced classroom teachers tacitly acknowledge in their daily practice: that it is the different ways children can and want to use words in schooling which is the measure of their language ability and the measure of much of their success potential in education. [...] To a very large extent, then, educational failure or success depends on children having the words, wanting to use them and being able to use them.

This study adds to the general investigation into and understanding of the state of immersion in South African schools, by providing some insights into the effects of different kinds of immersion on one aspect of language acquisition, vocabulary. The study revealed that differences between categories, such as ex-'Model C', rural and township schools, for instance, may be vast, even when all the schools fall within the ambit of the same national education department, and emphasised the multiplicity of factors that affect successful schooling. It also reminds one that there are children in the same classroom who may have experienced very different periods of immersion, and yet very little if any recognition is given to this fact. Incidental learning through communicative language activities does not seem to be adequate in building up a large enough vocabulary: it is hoped that this assessment of vocabulary at three levels will make a methodological contribution and may prove useful when applied in other studies dealing with immersion in the South African context.

REFERENCES

- Arnaud, J. & Artigal, J.M. (eds.) 1998. *Immersion programmes: a European perspective*. Barcelona: Publications de la Universitat de Barcelona.
- Arnaud, P.J.L. & Bejoint, H. 1992. *Vocabulary and applied linguistics*. London: Macmillan.
- Beardsmore, Baetens H. 1995. *The European School experience in multilingual education*. European Studies on Multilingualism 4:21-68.
- Barkhuizen, G.P. 2002. Language-in-education policy: students' perceptions of the status and role of Xhosa and English. *System* 30 (4): 499-515.
- Beaudoin, M., Cummins, J., Dunlop, H., Genesee, F. & Obadia, A. 1981. Bilingual education: a comparison of Welsh and Canadian experiences. *Canadian Modern Language Review* 37: 498-509.
- Bloch, C. 1999. Literacy in the early years: teaching and learning in multilingual early childhood classrooms. *International Journal of Early Years Education* 7(1): 39-59.
- Burmeister, P. 1998. The effectiveness of enhanced English instruction in preparation for bilingual instruction in the Schleswig-Holstein late partial immersion program. Pp. 667-674 in J. Arnaud & Artigal, J.M. (eds.), *Immersion programmes: a European perspective*. Barcelona: Publications de la Universitat de Barcelona.
- Coady, J. & Huckin, T. (eds.) 1997. *Second-language vocabulary acquisition: a rationale for pedagogy*. Cambridge: Cambridge University Press.
- Cohen, A.D. 1994. The language used to perform cognitive operations during full-immersion maths tasks. *Language Testing* 11(2): 171-195.
- Cooper, P.A. 1999. Lexis and the undergraduate: analysing needs, proficiencies and problems. Unpublished MA dissertation, University of South Africa, Pretoria.
- Corson, D. 1985. *The lexical bar*. Oxford: Pergamon Press.
- Corson, D. 1997. The learning and use of academic English words. *Language Learning* 47 (4): 671-718.
- Crow, J.T. 1986. Receptive vocabulary acquisition for reading comprehension. *Modern Language Journal* 70 (3):242-250.
- Daniel, A. & Nerlich, B. 1998. Analysing vocabulary acquisition in the Schleswig-Holstein Immersion Program. Pp. 647-657 in J. Arnaud & Artigal, J.M. (eds.), *Immersion programmes: a European perspective*. Barcelona: Publications de la Universitat de Barcelona.
- De Klerk, V. 2000. To be Xhosa, or not to be Xhosa ... that is the question. *Journal of Multilingual and Multicultural Development* 21(3):198-215.
- Genesee, F. 1983. An invited article. Bilingual education of majority-language children: the immersion experiments in review. *Applied Linguistics* 4:1- 46.
- Genesee, F. 1998. Immersion and multilingualism. pp. 151-161 in J. Arnaud & Artigal, J.M. (eds.), *Immersion programmes: a European perspective*. Barcelona: Publications de la Universitat de Barcelona.
- Grabe, W. & Stoller, F.L. 1997. Reading and vocabulary development in a second language: a case study. Pp.98-122 in J. Coady & Huckin, T. (eds.), *Second-language vocabulary acquisition: a rationale for pedagogy*. Cambridge: Cambridge University Press.
- Granville, S., Janks, H., Mphahlele, M., Reed, Y., Watson, P., Joseph, M. & Ramani, E. 1998. English with or without g(u)ilt: a position paper on Language in Education Policy for South Africa. *Language and Education* 12(4): 254-72.
- Hacquebord, H. 1994. L2 reading in the content areas: text comprehension in secondary education in the Netherlands. *Journal of Research in Reading* 17 (2): 83-98.
- Hofmeyr, J. 2000. Ex-Model C schools – melting pots of racial integration. *Frontiers of Freedom* 25: 21-26.
- Kickler, K. 1995. *Wortschatzerwerb im bilingualen Unterricht: pilotstudie zur Evaluierung der lexikalischen Fähigkeiten bilingual unterrichteter Schüler anhand eines kommunikativen Tests*. Kiel: I&F Verlag.
- Klippel, F. 1984. *Keep talking: communicative fluency activities for language teaching*. Cambridge (Cambridgeshire) New York: Cambridge University Press.

- Laufer, B. 1986. Possible changes in attitude towards vocabulary acquisition research. *International Review of Applied Linguistics* 24: 69-75.
- Laufer, B. 1992. How much lexis is necessary for reading comprehension? pp.126-132 in P.J.L. Arnaud & Bejoint, H. (eds.), *Vocabulary and applied linguistics*. London: Macmillan.
- Laufer, B. 1994. The lexical profile of second-language writing: does it change over time? *RELC Journal* 25 (2):21-33.
- Laufer, B. 1997. The lexical plight in second-language reading. Words you don't know, words you think you know, and words you can't guess. pp. 20-34 in J. Coady & Huckin, T. (eds), *Second-language vocabulary acquisition: a rationale for pedagogy*. Cambridge: Cambridge University Press.
- Laufer, B. 1998. The development of passive and active vocabulary in a second language: same or different? *Applied Linguistics* 19 (2): 255-271.
- Lesiak, J. & Bradley-Johnson, S. 1983. *Reading assessment for placement and programming*. Springfield: Charles C. Thomas.
- Nation, I.S.P. 1990. *Teaching and learning vocabulary*. Massachusetts: Heinle & Heinle.
- Nation, P. 1993. Vocabulary size, growth and use. pp. 115-134 in R. Schreuder & Weltens, B. (eds.), *The bilingual lexicon*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Obadia, A.A. 1998. An international overview of immersion programmes. pp. 80-93 in J. Arnaud & Artigal, J.M. (eds.), *Immersion programmes: a European perspective*. Barcelona: Publications de la Universitat de Barcelona.
- Pretorius, E.J. 2000. Inference generation in the reading of expository texts by university students. Unpublished doctoral dissertation, University of South Africa, Pretoria.
- Pretorius, E.J. 2002. Reading ability and academic performance in South Africa: are we fiddling while Rome is burning? *Language Matters* 33:169-196.
- Querol, J.A. 1998. Pedagogical approach, context and language in Early Catalan Immersion. pp. 94-113 in J. Arnaud & Artigal, J.M. (eds.), *Immersion programmes: a European perspective*. Barcelona: Publications de la Universitat de Barcelona.
- Read, J. 2000. *Assessing vocabulary*. Cambridge, UK: Cambridge University Press.
- Sarinjeive, D. 1999. The mother-tongue, English and student aspirations and realities. *Journal for Language Teaching* 33(2): 128-139.
- Smyth, A. 2002. Building literacy for learning. *Language Matters* 33:49-69.
- Swain, M. 1996. Integrating language and content in immersion classrooms: research perspectives. *Canadian Modern Language Review* 52 (4): 529-548.
- Wode, H. 1995. How little do we need? A European perspective on immersion teaching. Expanded version of paper given at Simon Fraser University, Faculte Saint Jean at Edmonton, and the University of Ottawa.
- Wode, H. 1998. A European perspective on immersion teaching: the German scenario. pp. 43-65 in J. Arnaud & Artigal, J.M. (eds.), *Immersion programmes: a European perspective*. Barcelona: Publications de la Universitat de Barcelona.
- Wode, H. 1999. Incidental vocabulary acquisition in the foreign language classroom. *Studies in Second-language Acquisition* 21 (2): 243-258.
- Xue, G. & Nation, P. 1984. A University Word List. *Language Learning and Communication* 3 (2): 215-229.

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