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Exposure To Language: Its Role In Exams

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Abstract:
A total of fifty-six Mathematics and English Language lessons, conducted in four 6 A classes were observed. The Maltese words in the 'Mixed Maltese English' variety used by the teachers were recorded, counted and converted into time. The data describing the exposure to spoken language was crosstabulated with the Mathematics and English Junior Lyceum Exam Results. By administering a questionnaire, information was gathered about other variables that expose children to English outside school. A moderate positive relationship between results and language use has been established for Maths. Some children who were exposed to more English, obtained better grades in the English language exam. The value of this statistical measure is slightly higher than that in Maths. A substantially strong positive relationship between the children's performance in the mathematics exam and their performance in the English language exam is evident. The research findings also highlight 'how' and attempts to find reasons 'why' code switching is adopted.

> Much of learning is possible only through the personal operation of language, unless the curriculum is planned so as to encourage a real communication and personal use of language, there will be considerably less learning.
>
> Marland, M. 1988, 'Language Across the Curriculum', pg 3.

Introduction

Language is the greatest tool to knowledge. Difficulties with language hamper understanding and growth in most areas of learning. In Malta, the Mathematics and English Language textbooks and examinations are in English. However, local research (Borg, 1980, Camilleri, 1995) has shown that both Maltese and English are

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normally used within any one lesson, so that the two languages seem to converge. Code-switching appears to be a natural result of being bilingual. Such cross-linguistic influence occurs at different degrees, depending on the teacher's style of speaking.

Bilingualism is an enormously widespread phenomenon, which has been readily discussed in international literature due to the complex linguistic and ethnic composition found in many countries. Malta has no explicit language policy within the educational system even though now "the National Minimum Curriculum considers bilingualism as the basis of the educational system" (NMC, 1999, p. 37). The language contact phenomena in the Maltese classroom has not been widely researched. Very little detailed functional analysis of mixed speech, as a medium of instruction at the primary level, has been conducted.

This longitudinal study investigates the complex use of the two languages as a spoken media of instruction. An attempt will be made at evaluating the impact of the bilingual medium of instruction on the children's success in the Mathematics and English Language Junior Lyceum Exams. Moreover, general characteristics of language choice and the motivation for code-switching in the lessons observed are evaluated. Therefore, this research ambitiously attempts at trying to quantify the teacher's language use, as well as to qualify 'how' and 'why' the mixed language is used.

Thus, the main research question dealt with in this paper is:
Are children who are judged as having had a comparatively high exposure to English through out the year, likely to achieve a better grade in the Mathematics and English Language final exams?

More importantly, the study attempts to establish the prevalent functional and contextual variables that affect the teacher's use of language as a medium of instruction.

Research Design and Procedures

Qualitative analysis of observations, as well as quantitative analysis of language occurrence, exam results and questionnaires feature in this research. The relative influence of language exposure on the children's performance has been investigated via non-participant, objective observation. Observation techniques reveal characteristics of language use that are impossible to discover by other research methods and tools.

Verbal events have been quantified in as systematic and objective a way as possible. The data was then coded, analysed and interpreted. This longitudinal study (October 1999 – February 2000) was conducted in four schools, two from the North of Malta and two from the South. The four schools were chosen at random. For the purposes of anonymity a number will refer to each school. Mathematics and English Language lessons conducted in the year 6 A classes of every school, were observed. Two schools were alternatively visited every week. It would be unrealistic to expect an observer to record everything that happens in a classroom, in this case the lessons' complete sequences of interaction. Thus, only the Maltese used by the teacher and the pupils was recorded in writing, on specifically designed grids. This was possible because all four teachers conducted the Mathematics and English Language lessons mainly in English, with the occasional insertion of Maltese words. Ellul (1978) referred to this type of utterance as (Em). Even though the children's utterances were mainly in Maltese (Me), they were still managed since very little opportunity was generally given to the children to participate in the lessons.

At times, when the participants spoke faster than usual, the writer could not cope. All four teachers gave permission to record parts of the lesson when such difficulties were encountered. The writer then supplied any words that had been missed out by listening to the recorded tape. As can be seen in Table 1 the teachers' and pupils' language use was divided into three categories according to the function of the utterance. The social meaning of the response was preserved since the grid was not highly constraining. The schedule enabled the researcher to identify the participants' tendency of using Maltese or English for different purposes.

The number of Maltese words used by the teacher and pupils separately was counted. Words were converted into time, in minutes, by establishing the measure of one second for every word uttered. The duration of the lesson was calculated. Time in which no overt communication was present between the teacher and the pupils, such as time allotted to written class work, was deducted.

	Language Categories		
Teacher	Instructions while teaching	Instructions non-teaching	General interaction
Pupils	Questions asked	Response to questions	General interaction

Table 1: Language categories according to the function of the utterance

The recording grid, though useful, cannot take into account emotions, tensions and hidden agendas. The language events recorded on the grid were contextualised by writing up a reportage. This was done as quickly as possible after observation (usually on the same day) thus eliminating the risk of forgetting to record observations made about the ongoing language use. Time in which no overt communication was present was utilised for making brief notes. These notes were then supplemented with fuller accounts when writing out the reportage. Such language and lesson features recorded in the reportage are discussed in the research findings.

A simple questionnaire consisting of twenty closed form items was administered to fifty among the hundred and nineteen children that make up the sample. Systematic sampling was adopted. Every second or third on the class list, (depending on the number of children in each class), was given the self-completion questionnaire. Even though no complex questions were present, the questionnaire was still thoroughly explained in Maltese. Moreover, clear written instructions, using simple English, were given in the introductory part of the questionnaire. Through the questionnaire exposure to language, as well as variables such as home background, reading, computer and television were considered. These all play a determinant role in affecting the child's language performance in examinations.

Research Findings and Evaluation

Quantitative Analyses

The teacher's use of Maltese (Maths lessons) featured in Table 2 was grouped under three different categories so as to facilitate the analysis. Thus, language use during the Mathematics lessons has been rated as 'Least Exposed to Maltese' (as in the case of School 1), 'Moderate Exposure to Maltese' (as in the case of School 2) and 'Most Exposed to Maltese' (as in the case of Schools 3 and 4). In referring to language use during the English language lessons, the close proximity in the quantified usage of Maltese between Schools 1 and 2 and between Schools 3 and 4, as seen in Table 3, utilised the two extreme value labels. The teachers observed made less use of code-switching during the English language lessons. School 1, School 3 and School 4 fall under the same categories of exposure, in either table, irrespective of the subject being taught.

Use of Maltese in *Mathematics*			
Class	Total Observation Time in minutes	Teacher's usage of Maltese in words	Teacher's usage of Maltese in minutes
School 1	330	787	13
School 2	263	1844	31
School 3	283	3680	61
School 4	385	4560	76
	1261	10871	181

Table 2: Use of Maltese in the Teaching of Mathematics

Use of Maltese in *English Language* Teaching			
Class	Total Observation Time in minutes	Teacher's usage of Maltese in words	Teacher's usage of Maltese in minutes
School 1	276	437	7
School 2	249	474	8
School 3	274	1081	18
School 4	255	1032	17
	1054	3024	50

Table 3: Use of Maltese in English Language Teaching

The characteristics under analysis were assigned values (of no particular significance) in the Data Editor[1] on a nominal measuring scale.

Tables 4 and 5 show a crosstabulation between the grades obtained by the children in all four schools and the amount of exposure to language, during the Mathematics and English language lessons respectively.

Mathematics Exam Results	Exposure to Maltese during Mathematics Lessons			Total
	Least Exposed to Maltese	Moderate Exposure to Maltese	Most Exposed to Maltese	
Grade A	14	4	___	18
Grade B	12	18	16	46
Grade C	3	8	34	45
Grade D	__	___	10	10
Total	29	30	60	119

Table 4: Crosstabulation
Mathematics Exam Results by Exposure to Maltese during Mathematics lessons

[1] All statistical calculations were made by using the Statistical Package for the Social Sciences (SPSS) Base 9.0 for Windows.

English Exam Results	Exposure to Maltese during English Lessons		Total
	Least Exposed to Maltese	Most Exposed to Maltese	
Grade A	29	3	32
Grade B	25	19	44
Grade C	5	21	26
Grade D	___	15	15
Grade E	___	2	2
Total	59	60	119

Table 5: Crosstabulation
English Exam Results by Exposure to Maltese during English lessons

An eyeball test[2] of this data indicates a tendency for children who are exposed to more English to obtain better grades. This seems to be especially so with the English Language results where the Grade A shows the count of 29 children in the case of the 'Least Exposed to Maltese' category as against the 3 children in the 'Most Exposed to Maltese' category. The fact that a Grade D or a Grade E in the English exam was obtained only by children in the 'Most Exposed to Maltese' category is interesting. There is little difference between the counts for the Grade B (25 children under the 'Least Exposed to Maltese' category and 19 children under the 'Most Exposed to Maltese' category).

Language exposure seems to play a slightly less determinant role in influencing the grades obtained in the Mathematics exam. Grades B and C were still obtained by more than half the sample (76 children), all of which fall under the 'Moderate' or 'Most exposed to Maltese' category. Children who obtained a Grade D in the Mathematics exam were the ones who were least exposed to English amongst the four schools. No Grade A was obtained in English language by children who fall under the 'Most Exposed to Maltese' category.

Since the working data file contained nameable data (values which have no intrinsic order), the crosstabulation statistics yield the Phi and Cramer's V measures, as well as

[2] An eyeball test is an inspection of results prior to formal statistical testing. Thus the researcher comes to conclusions about the results in the tables without yet knowing the formal rules of significance decisions.

the Contingency coefficients of correlation. Their value shows the relationship between the number of children obtaining the different grade and the number of children under the different categories of exposure.

Level of Measurement	Symmetric Measures	Value	Significance
Nominal by Nominal	Phi	.640	.000
	Cramer's V	.649	.000
	Contingency Coefficient	.539	.000
	Number of Valid Cases	119	

Table6: Crosstabulation Statistics
Mathematics Exam Results by Exposure to Maltese during Mathematics Lesson

Level of Measurement	Symmetric Measures	Value	Significance
Nominal by Nominal	Phi	.700	.000
	Cramer's V	.495	.000
	Contingency Coefficient	.573	.000
	Number of Valid Cases	119	

Table 7: Crosstabulation Statistics
English Exam Results by Exposure to Maltese during English lesson

The values shown for the statistical procedures in tables 6 and 7 establish that there is a moderate positive relationship between the grades obtained in the Mathematics and English Language exam and the exposure to English during the lessons. The strength of the relationship between English language results and exposure to English is slightly stronger as indicated by the coefficient (.700). The coefficients of correlation are significant ($p < 0.001$) in both tables. The highly significant results demonstrate that the relationship is not due to chance.

The correlation between the results obtained by the children and exposure to the 'lingua franca' in exams, is alternatively illustrated in the bar charts (Figures 1 and 2). The graphs compare the frequencies, by category of exposure, to the grades obtained in the Mathematics and English examinations respectively.

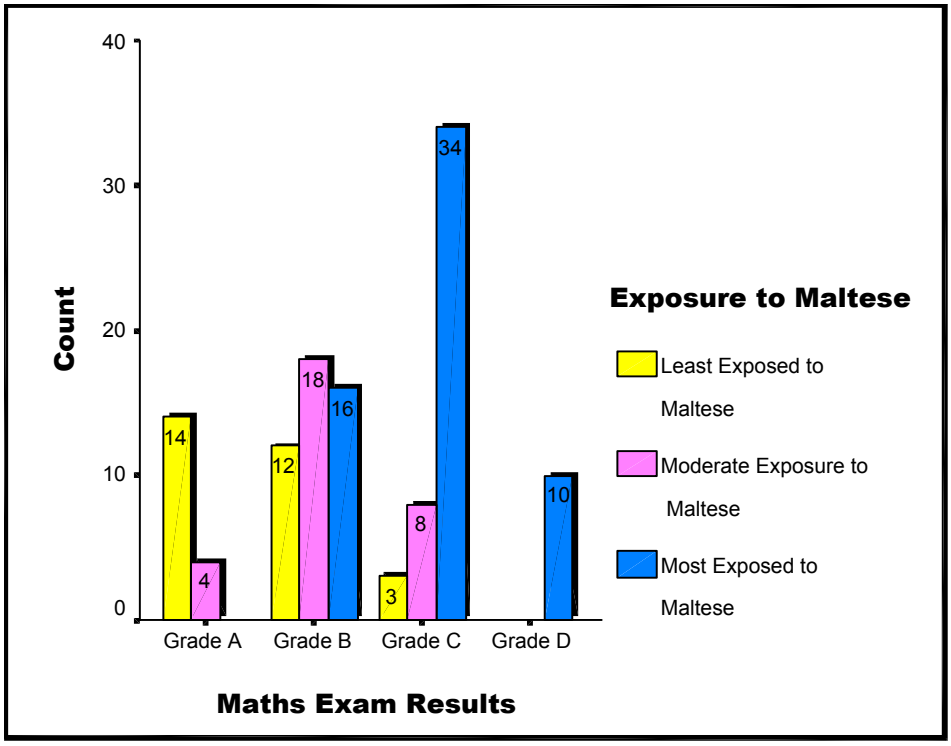

Figure 1:
Relationship between the Grades achieved in the Mathematics Exam and the Language Exposure during the Mathematics lessons

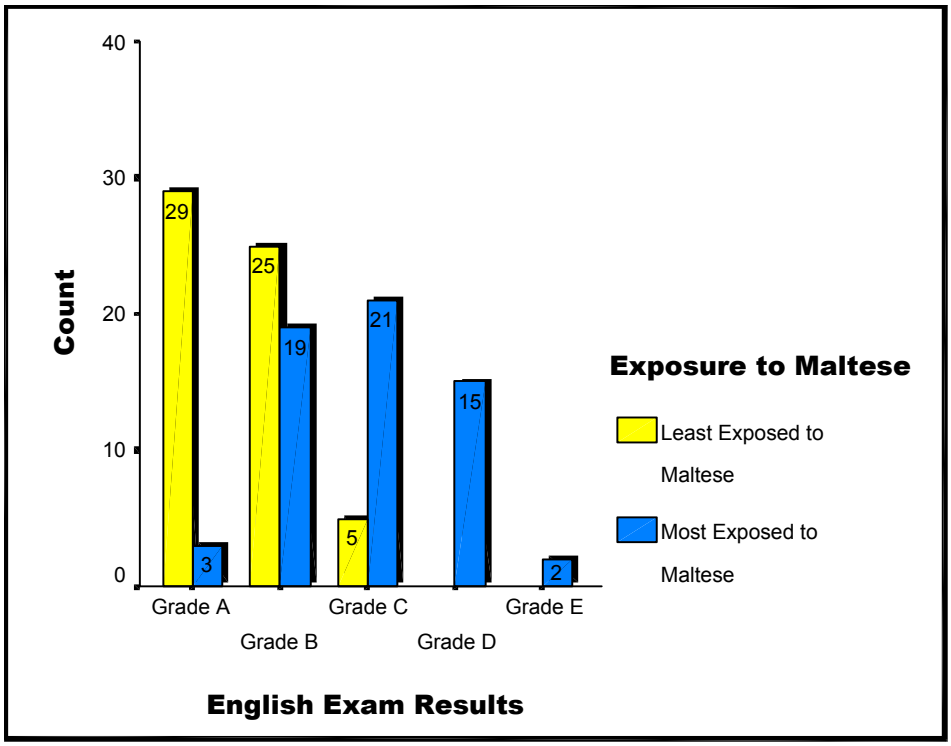

Figure 2:
Relationship between the Grades achieved in the English Exam and the Language Exposure during the English lessons

Table 8 attempts to analyse whether the children who demonstrate higher linguistic competence obtained higher grades in the mathematics exam. None of the children who obtained a grade C (or below) in the English language exam achieved a grade A in Mathematics. A small percentage (35%) of those achieving a grade C in English obtained a grade B in Mathematics. More than half (55%) of those who obtained a grade B in the English exam, obtained the same grade in the Mathematics exam too.

Mathematics Exam Results	English Exam Results					Total
	Grade A	Grade B	Grade C	Grade D	Grade E	
Grade A	11	7	___	___	___	8
Grade B	13	24	9	___	___	46
Grade C	8	13	15	8	1	45
Grade D	___	___	2	7	1	10
Total	32	44	26	15	2	119

Table 8: Crosstabulation
Maths Exam Results by English Exam Results

The values shown for the statistical procedures in table 9 establish that there is a substantially strong positive relationship between the children's grades obtained in the Mathematics and English language exams. This suggests that performance in mathematics is dependent on language competence. The coefficients of correlation are significant ($p < 0.001$).

Level of Measurement	Symmetric Measures	Value	Significance
Nominal by Nominal	Phi	.748	.000
	Cramer's V	.432	.000
	Contingency Coefficient	.599	.000
Number of Valid Cases		119	

Table 7: Crosstabulation Statistics
Maths Exam Results by English Exam Results

Qualitative Analyses

Exposure to language during the Teaching of Mathematics

The observation of twenty-eight Mathematics lessons was aimed at gathering information about the various uses of language in Mathematics teaching. The written texts used in mathematics books and exam papers and the teacher's oral discourse were the most evident uses of language observed. The children's responses fell below expectations.

On many occasions, the questions read aloud by the children were not fully comprehended.[3] Blank looks, fidgeting, loss of interest or the children asking many questions often followed this. The children often found it hard to develop a strategy of solution and thus to decide on a mathematical model. This is probably because English hinders them from forming mental representations of the information given. This does not mean that the child lacks conceptual knowledge and mathematical potential. Rather, it is the difficulties with handling the language, which probably hinders some children from recognising the mathematical idea, which they have existing knowledge about.

The difficulty encountered with the language probably arises because of the style of mathematics register, which differs from that used in narrative or discourse. It features a mixture of ordinary English as well as a specific, formal vocabulary.

The technical mathematical language is not used in normal everyday conversation. Thus children tend to forget its meaning. This is an observation made during a 'revision' lesson, just a few days before the Annual Examinations.

Problem sums often contain unnecessary data. This makes it more difficult for the children to analyse precisely what they read. The children must select which

[3] Occasionally the children also made errors in the actual reading of the mathematical text. Thus, reading errors may precede difficulties in comprehension. The two abilities seem to be interdependent.

information is needed. Word-free computational problems seem to be more appealing than worded arithmetic problems possibly due to the children's difficulty with English. The Examination paper contained few number type problems.

Some of the children observed not only have difficulty in comprehending the mathematical jargon / argot but also struggled with the simple English. Passages in the Mathematics exam papers offer fewer context clues to the meaning of an unknown word or phrase such as 'retailers', than an ordinary English Language passage would.

Children also confused words, which have both a conversational and mathematical meaning such as 'product', 'even', 'mass' and 'nets'. Moreover, different words are used to describe the same operation in different contexts. 'Add', 'sum' 'total', 'more than' and 'plus' are all used to describe the (+) operation.

The graphic images and the presentation of the page in the textbook influence the reading process. 'Mathematics: A Basic Course' is a graded textbook which has been used in State Schools for many years.[4] The style used here does not stimulate interactive reading. This was evident in the children's degree of involvement when dealing with tasks in the book The ideas introduced are rarely accompanied by attractive pictorial and concrete examples, which would facilitate reader comprehension. Mathematics is portrayed as an activity that yields answers to problems, and not as a language useful in formulating, clarifying and communicating ideas. The 'compartmentalised' structure of the book does not facilitate readers' use, application, transfer and generalisation of mathematics.

Even though children are exposed to English language through the written medium (textbook, worksheets, past papers), the most important resource in the classroom is the teacher. Some spoken language characteristics were common among the four teachers, including the extensive use of code switching, as in:
"issa, din hija *partly revision* ta' dak li għamilna *two weeks ago*."
"hawn ara hi tat *twenty cents*, dik hija *given* hu?"

4 The first edition of ' Mathematics: A basic course 1' was published in 1979.

No lesson was observed in which Maltese or English were solely used as a medium of instruction. It was observed that at times, the teachers unconsciously followed a certain pattern in their use of language. Certain words and phrases, as seen below, were switched predictably during the several lessons observed. Moreover, every teacher had his or her own speech characteristics and linguistic behaviour.[5] For example, one particular teacher continually made use of the phrase "hux vera?" while explaining.

Most characteristics of language use highlight functional variables that influence the use of language. Different bullets are used for different purposes:

- ❖ Indicates that the particular characteristic of language use was observed in both the Mathematics and English Language lessons.
- ➢ Indicates that the particular characteristic of language use was observed especially during the Mathematics lessons.
- ❑ Indicates that the particular characteristic of language use was observed especially during the English language lessons
- ❖ Teachers used short, Maltese words as linking devices and 'fillers' between two English phrases, as in:

  "Do I have any remainder here? *Mela, l*-answer *se jiġini* eighteen without any remainder."

- ❖ Maltese was often used to attract the children's attention. A complete sentence in English was often preceded by one or two Maltese 'attention getting' words, as in:

  "*Tajjeb, mela*, did you find any difficulties in your homework? *Sewwa*, now what we are going to do is….*Attenti, hawn* we have…"

- ➢ Code - switching was influenced by the topic being dealt with and by the context. With practical tasks, such as plotting graphs or measuring angles, there was a

[5] In sociolinguistic terms, this is referred to as the speaker's 'idiolect'.

tendency for the teacher to use more Maltese. Hands on experience requires detailed, step by step instructions. In lessons on problem sums, English was given more importance. The language used in the problem sums seemed to shape the language used during the lesson. In general, the children's attitude towards story sums is one of fear. In one particular class the teacher kept repeating that "there is nothing to be afraid of".

- ❖ English nouns, being used within a mainly Maltese sentence, were given Maltese articles:

  "*fil* – correction", "*il* – height", "*ir* - writing", "*l* - *i*statement", "*id* - dictionary", "*it* - three"…

  In turn, it was noted that when asking questions, the children's use of language reflected their teacher's language use.

- ❖ The teacher often used Maltese when dealing with difficulties on a one – to – one basis as against when approaching the class as a whole. For example, when trying to control a fight between two boys, the teacher's use of complete Maltese (and thus no code switching) was very evident.

- ❖ The teachers used less English, in informal conversations, as in:

  "Yesterday? *Trid tara kemm feraħ it-tifel tiegħi*…"

- ❖ Some of the children tried to speak in English when addressing the teacher in front of all the class, however when interacting with their friends they would immediately turn to Maltese.

- ➢ Classroom instructions were mostly expressed in Maltese.

  "…inżel isfel, fl-*office* tal – *head* u ġibli…"

  "oħorġu l-pitazz, m'hemmx paroli !"

- Maltese was often used when making important statements or for maintaining discipline, as in:

  "Jekk hawn xi ħadd li mhux qed jifhem iwaqqafni fejn ma jifhimx mhux imbagħad jiġi fil-brejk u jgħidli li mhux qed jifhem. Jekk hawn xi ħadd li mhux qed jifhem , issa jgħidli"

  "xi ħadd sejjer fil-kurutur..?"

- Mathematical terms played an important role in determining the amount of English words uttered by the teacher. These were extensively inserted within the Maltese context, such as, words like:

  "common factors", "problems", "cancelling", "improper fraction", "prime number", "lowest term", "numerator" "breath", "diagram", "area", "sides"…

- Technical data representation terms such as "horizontal", "vertical" and "axes" were also used. However, when introduced for the first time, some of these were given Maltese translations, "il-mindud", "il-wieqaf, and "fejn niktbu n-*numbers*" respectively.

- Moreover, there was a tendency for Maltese to be used so as to positively or negatively reinforce a particular behaviour:

  "brava, tajjeb", "m'hawnx għalik"

  "żommu dritt, x'taħseb li int?", "ħażina tiegħek"

There was a tendency among the teachers to use more Maltese when getting angry with the children. Does Maltese sound 'harsher'?

- During the mathematics lessons, the teachers seemed to use translation unintentionally. Switching to Maltese appeared to be a natural reaction rather than an attempt to explain meaning. Phrases such as "well done", which the children surely understand, were still followed by translation ("prosit").

- Some Maltese phrases were translated. Since the children understand Maltese perfectly, this was probably done consciously, so as to expose the children to commonly used English phrases:

  "Minflok, instead of…"

- Translation was often used for clarification purposes, such as when the teacher asked a question which nobody attempted to answer, as in:

  "…something more than that, hemm xi ħaġa iktar"

- Code switching was used for repetition and consolidation purposes. During new explanations, there was a tendency for the teacher to use more Maltese.

  "Li qed ngħid ħa ngħidu bil-Malti, ħa tifhmuni żgur…"

- However, when exposing the children to further examples, there was a tendency to move from Maltese to English.

- Story sums were often translated into Maltese or re-phrased into simpler English to ensure comprehension. This was often done without even checking how far the children had comprehended from the English version offered in the textbook. When linking mathematical concepts to everyday experiences, most of the teachers used more Maltese than English.

- English words, which have an exact Maltese translation, were still used within a Maltese context, as in

  "cents" (ċentezmu), "homework" (xogħol għad – dar), "head" (surmast), "office" (uffiċċju)

Habit could be a possible reason. Moreover, it could also be a case of 'linguistic convenience' (Ellul, 1978). 'Ċenteżmu' might be considered as being too long to cater for everyday linguistic needs.

- 'Loanblends' were encountered during the observations, as in:

  "trid tik*cancel*ja", "dak l-ip*plott*jajna", "jip*push*jawhom"

In these examples the English words were unconsciously inserted (phonologically and lexically) in between the Maltese affixes.

❖ Maltese influence on the teachers' use of English was evident at phonological level, in words such as "tot*a*l", "numeric*a*l" and "fact*o*r" (stress on final syllable). In a prescriptive linguistic sense, this would be considered as being incorrect.

➢ The teachers used English stock phrases, on occasions which were similar in nature:

"there's too much talking going on..",

"any difficulties, so far…"

"hands up"

"pencils down"

➢ The teachers often related keywords such as 'more' and 'less' to particular mathematical operations. The use of keywords may, at times, be a distracter rather than a clue. For example, the use of 'how much *more* is needed?' and 'what must be *added*?' signals the idea of addition rather than subtraction.[6] Hints such as "dawn tat-tnejn fuq xulxin" were often expressed in Maltese.

➢ Common English expressions were also sometimes inserted within a Maltese context:

"so far so good ?", "just a minute!"

❖ There was a tendency for short Maltese words to be used so as to elicit a response, as in:

"…*ftehma,* about this?", "…*kulħadd*, alright with this?"

[6] The following is an example of this subtraction structure in the context of money:
Dad has saved up Lm 285 towards a holiday costing Lm 416. How much **more** does he need to save?

- There was a tendency for the more challenging questions to be asked in Maltese, whereas questions requiring a closed – ended answer (such as 'yes' / 'no') attracted the use of English.

- The pupils often answered the teachers' questions in English but there was a tendency for them to ask questions in Maltese (excluding numbers and mathematical terms such as 'times' and 'remainder'). Answering the teacher's question during mathematics usually involved the use of one-word answers such as numbers or only a few words such as "I plus them." Forming a question involves more syntactic knowledge of the language. When the teacher's question required a lengthy answer (such as giving a reason for something), the children were prone to switching to Maltese, as in:

  Teacher: What's happening here?
  Pupil: Qed jiżdied bit-*three hundred*, miż - żgħir għall-kbir.

- As stated above the children lacked the necessary confidence to ask questions in English. For example, on one occasion, when the teacher encouraged the children to speak in English, a girl immediately reacted by putting down her hand, thus preferring to ask no question at all.

In general, the teachers seem to give little importance to language factors and their effect on the children's performance in Mathematics. During the class corrections, the children were told to explain the method they used in arriving at their answer. The researcher noted that when verbalising their reasoning, the children, in general, felt more confident in using Maltese. This often led to very little mathematical language being used. No instance was observed in which any of the four teachers drew the children's attention to the appropriate use of language. Askew (1988) highlights the role of discussion and appropriate use of language in helping the children develop mathematical ideas. By participating, through the use of language, incorrect views are expressed, clarified and corrected.

This study amalgamates the two uses of language in the learning of Mathematics. This is because it focuses both on the structure of the language used by the teacher in the mathematics classroom and its influences on the children's performance when dealing with the written medium.

Exposure to language during English Lessons

Speaking and writing tasks, and thus the use of the productive skills, are greatly simplified if pupils have sufficient exposure to the language. In the classroom, children are exposed to English both by listening to the language being used by the teacher and peers, as well as by the written medium presented in the books. The former appears to have a greater impact on the language learning process. Observing and examining the teachers' practice enabled the writer to become aware of some of the methods and attitudes to language.

> "We might say a great many complicated and subtle things about the value of creative writing and literature in school. But unless we see them as both rooted in commonplace habits of speech, we shall not understand them alright or use them as effectively as we could."
>
> (Britton, J. cited in Jones, A. & Mulford J.1971, p. 53)

Traditional language teaching emphasised reading and writing, frequently at the expense of the ability to speak and understand. The four teachers observed all followed this language teaching trend. Harmer (1997) explicates that the function of writing is "often to reinforce new language learnt orally."

The teachers observed mainly employed the Grammar – Translation method. Other methods such as the Oral-aural method (extensive use of drills), the Audio-visual method (extensive use of pictures and tapes), the Direct method (teaching through the extensive use of the target language) and the Communicative approach (extensive use of language as a means of communication) were rarely employed[7].

[7] Even though grammatical and formal language teaching should not be neglected, they should be integrated into a fuller understanding of the context and the 'audience'.

The focal aim of all teaching in the Maltese classroom appears to be examinations rather than training the child for communicative efficiency. In the study it was noted that a tense atmosphere was brought about by such method of assessment. In the first month of the scholastic year, the writer recalls the teacher in School 1 saying:

" Attenti hawn, fl-eżami se jkollkom *this sort of exercise.*"

The Junior Lyceum examination involves no oral component. Thus teachers would regard the student's real world communicative needs as being of minor or no importance. Section I and II targeted language accuracy, reading and comprehension. The exercises in section I tested the children's:

- ability to use a variety of essential vocabulary and grammar items (Exercise A),
- ability at logical sequencing and identifying a number of specific vocabulary items linked to matching pictures (Exercise B),
- ability to use correct tense conjugation within a given dialogue (Exercise C) and
- ability to use linking words, by matching correctly the parts of given sentences (Exercise D).

The relevant information to answer all the comprehension (Section II – Exercise E) questions was available in the text. Words in the questions made the text area identifiable. Seven out of eleven were open-ended questions asking for specific and inferential information. The chief examiner reports that inappropriate sentence structures, incorrect tense usage and irrelevant information were evident in a number of the children's answers (Junior Lyceum Entrance Examination Report, 2000). A limited number of candidates successfully managed the two vocabulary related questions.

Section III (Exercise F) involved choosing one composition task out of four. The latter had 'help' prompts to stimulate the children to react and think about their choice. During the exam, some children tend to transpose parts of prepared essays, which have been memorised. This resulted in deviating from the subject of the set title. Poor levels of the basic use of writing skills were evident through spelling errors, lack of idiom and limited vocabulary (Junior Lyceum Entrance Examination Report, 2000).

Examinations (among other factors) result in the children's contact with English being of the input-without intake variety; one in which the children simply hear the language from the teacher but are given little opportunity to exercise speaking skills. Exposing the language during the lesson cannot guarantee the learning of it. For input to become intake, what is required is that it is worked on in some way, by motivating the children to react linguistically to the input and to participate in the lesson. This will result in enhancing their speaking and listening skills, and in turn their overall performance in the language.

Extensive exposure and use of English appears to lead to unconscious learning and better mastery of the language. The apparent effects of the 'quasi' total 'Immersion Bilingual Education'[8] experienced by children attending private schools in Malta, provide evidence of this statement.

Common characteristics of how Maltese and English operate during the English Language lessons observed in the four schools, are reported below. An attempt is made at discovering the reasons for the use of code - switching.

- Only two of the four teachers observed seemed to be perfectly at ease with their use of English. There was a tendency with the other two teachers to pause a lot and to produce 'slips of the tongue':

  "Do you know that or *no*?"

  "I'm going to give *you* out…"

  "…that's the first question *to whom* you should always ask."

  "*you may* read it please?"

- The teacher's area of specialisation seems to play a role in determining the amount of English used in the classroom, both for academic and non-academic purposes. This information was gathered while interacting with the teachers involved in the study, during break. The teacher whose main area of study was Physical

[8] This term has been used by Baker (1997, p.175) so as to describe a type of bilingual education which emphasises extensive second language use.

Education and the teacher whose main area of study was English language showed a contrast between the quantity and the quality of the language used.

❖ As often occurred during the Mathematics lesson, there was a tendency for Maltese phrases to be followed by their English equivalent. The motive behind this cannot be the children's understanding, for all the children know Maltese.

"jien għidtlek, jien avżajtek, I warned you"

"*kif tispiċċa*?, how does it end ?"

- The teacher often started off a sentence in Maltese but quickly switched to English in realising it, as in:

"*Tridu tagħmlu* the homework on your .."

- The questions asked by the teacher were generally aimed at displaying and practising grammatical structures rather than obtaining information via the communicative process. Such questions, to which the teacher already knew the answer, were the main source of communicative activity.

- Moreover, there was a tendency for uttered sentences to be made up of consecutive phrases omitting conjunctions, as in:

"Take out your grammar book**,** only the grammar, no reading today."

❖ When finding difficulty in expressing himself or herself in English, the teacher randomly made use of Maltese words. Facial expressions revealed that the teacher had temporarily forgotten the English equivalent.

- There was a tendency among the children to use short 'telegraphic' sentences, which omit function words such as "the". The content words that carry the main message were stressed.

❖ The influence of Maltese on the children's syntactic structure of English sentences was evident:
"..everybody looks forward *for* the weekend" (instead of using 'to')

(influenced by the Maltese equivalent "*għall* – weekend")

"I *cut* some flowers" (instead of using the verb 'to pick')
(influenced by the Maltese equivalent "naqta' l-fjuri")

"She cooked me a fish ball *by her mind only*"
(influenced by the Maltese 'minn moħħha')

"…*in* nine o'clock"
(influenced by the Maltese 'fid-disgħa')

- There was a tendency among the children to give one-word answers. The reaction to this varied from teacher to teacher, as well as from lesson to lesson. The chief examiner reports that "Some students clearly need more training in using complete sentences in their answers" (Junior Lyceum Entrance Examination Report, 2000, p. 60).

- Most of the children found it harder to ask the questions, than to answer in English. The complex sentence pattern involved in forming a question posed difficulty.

  - When asked to give the meaning of certain words, the children relied on their semantic knowledge of Maltese words having similar sounds, as in:

    Spacious - "spazjuż"

    Export - "tisporta"

  - However, translating literally from one language to another, may lead to many mistakes:

    Teacher: "When are you given homework?"

    Pupils: "All day" (confused by the Maltese 'kuljum')

- Among the children observed, problems with using the appropriate verb conjugation were also evident.

"They *want* to *took* the money"

- At times the teacher provided the first few words of the sentence so as to encourage and lead the children on to the right track, as in:

  Teacher: "What did the person Heidi had visited have?"

  Teacher: "She was…"

  Pupils: "Blind".

  Teacher: "She couldn't see"

This sometimes resulted in the children giving only one – word answers. It is difficult for such answers to lead to an improvement in the oral domain.

- Sometimes the teachers answered their own questions by posing simpler questions containing the required answer, as in:

  "What does 'she was miles away' mean? Was she paying attention or not?"

- Most of the times, the teachers dealt with compositions by providing a detailed plan. Such a plan was written on the board and guided the children's ideas and paragraph structures. The teachers often stressed that such guidelines could be ignored - the children could develop their own ideas if they wanted to. Why should the children try to be creative in their writing, in a situation where the ideas have been presented on a silver plate?

- The teacher used Maltese, so as to encourage the children to use the target language.

  "*ejja, isa,* try to say it"

- Short Maltese words often started or ended English sentences uttered by the teacher, as in:

  "*qed tara*, when I remind you"

"you can use it, *ta*' "

- Some teachers adopted the approach of repeating in English what the children have said in Maltese.

- On the whole, the teachers gave very little importance to the children's pronunciation and intonation while speaking and reading.

- Teachers' personal interjections or asides were generally in Maltese.

- The children seemed to put more effort in trying to use complete English during the language lessons than they did during the Mathematics lessons. In turn, there was a tendency among the teachers to give relatively more importance to the children's oral productive skills during the language lessons. More was expected from some children than from others, in this respect.

- There was a tendency among teachers who adopted the approach of explaining meaning by using simpler English, to make less use of translation. Translation is a quick and efficient way to present the meaning of words but the children might opt-out of listening the second time[9], therefore defeating the scope of having an English lesson. It may make it a bit too easy for the children by discouraging them from interacting with the words.

- Effective vocabulary teaching techniques such as realia, pictures, gestures, using sense relations[10] and putting meaning in context were in general, rarely used during the lessons observed.

- There was a tendency among the children to reinforce the teacher's explanation of the new vocabulary by translating into the Maltese equivalent, as in:

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[9] This applies to cases where the teacher might first explain in Maltese and then repeat the same thing in English.

[10] Words have meanings in relation to other words. For example the meaning of a word like 'good' can be explained in the context of a word like 'bad' (antonyms) or by presenting other words which have similar meaning such as 'right' (synonyms). Moreover, a general word such as 'furniture' can be explained by referring to specific words, which fall under that category such as 'table' and 'wardrobe' (Harmer, J. 1997, p. 156).

Teacher: "…sister in law, that means her brother's wife"
Pupils: "il-mara ta' ħuha"

- One teacher in particular depicted English language learning as being made up of rules and lists to be memorised from the 'Junior English' and the 'Merlin English' textbook. The latter is a locally published book, which offers a very dry picture of the subject. The examples and exercises make reference to Maltese towns and villages, feasts, traditions and currency. This is one of the few positive aspects offered by the book. Grammatical technical words such as 'homophones', 'auxiliary words' and 'ordinal tense', were given great importance during the lessons. The children were expected to study the grammar rules in detail. Will they be able to readily apply such rules while using their speaking and writing skills?

Conclusion

'Linguistic knowledge' is one of the seven major factors (identified in research literature) as contributing to students' difficulties in Mathematics (Lambdin Kroll & Miller, 1993).[11] The authors further state that it is the interaction among *all* the factors that often influences performance rather than one factor contributing individually. It is an oversimplification to only equate language difficulties with problem-solving difficulties. This study appears to corroborate these findings. This is because only a moderate positive relationship between results and language use has been established for Maths.

Some children who were exposed to more English, obtained better grades in the English language exam. The value of the statistical measure is slightly higher than that in Maths, but it still falls under the 'moderate positive relationship' category on

[11] The other factors involved in solving mathematical problems efficiently are: algorithmic knowledge, conceptual knowledge, strategic knowledge, attitudes, metacognition and sociocultural experiences (Lambdin Kroll & Miller, 1993, p. 62).

the scale of correlation. Far too many other variables, such as intelligence, creativity and sociocultural factors play a role in determining achievement in exams.

Moreover, the statistical results suggest that there is a substantially strong positive relationship between the children's performance in the mathematics exam and their knowledge of English language (as shown by the grade achieved in the English language exam). This suggests that performance in Mathematics is dependent on language competence. Thus, the importance of integrating the two fields of Mathematics and English language in the classroom is highlighted. The latter appears to link naturally to the former, and yet the observations revealed a tendency to view the two subjects as being distinct. Teachers seem to give little importance to language as a vehicle to learning.

Camilleri (1995) claims that code - switching is "a useful pedagogic and communicative resource" (p. 221). Code - switching was extensively used, at different degrees, during *all* the fifty-six lessons observed. The functional and contextual variables, which seemed to determine language use commonly across all the four classrooms, reveal that code - switching helps rather than hinders learning. In general the children seemed to grasp the new concepts relatively easily. The frequent interchange in the use of Maltese and English appeared to make the children feel at ease, thus providing a quality learning environment. However, the language presented in books seemed to hinder the children from independently applying the concepts learnt. During class work the children seemed to require constant assistance with understanding the question. The teachers would then readily help the children around the language situation.

This research effectively highlights 'how' and attempts to find reasons 'why' a particular language pattern is commonly adopted.. Language certainly appears to be the teacher's most precious skill.

Limitations of the Study

In the research, words were converted into time by establishing the measure of one second for every word uttered. However, the rate of the number of syllables per second varies from one person to another. Also, the number of words uttered by the teacher was very much dependent on the children's participation during the lesson.

The data-gathering techniques used in the study require a variety of research skills, especially sustained concentration, categorisation and recording, note taking and impartiality. Although the researcher tried to be as precise as possible in recording and quantifying the vast amount of data available, slight human errors might have occurred. Thus, the use of additional sources of evidence, such as the reportage, support the interpretations of events.

Another limitation of the study is that since only four year 6 teachers have been observed, the characteristics of language use during the Mathematics and English language lessons cannot be generalised to all the teachers. The common spoken language characteristics between these four teachers might be credited to chance.

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