

## ***An Evaluation of the Maltese School Literacy Environments and Practices of Students With Down Syndrome***

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### **Abstract**

This study aimed to evaluate the literacy abilities of students with Down Syndrome (DS) from the perspective of educators while also evaluating the school literacy environments of students with DS within the Maltese context. This enabled the researchers to investigate the level of collaboration between educators and other professionals, to evaluate whether educators were sufficiently knowledgeable about their students' abilities and how to use these skills to help them progress through the literacy acquisition journey. A quantitative explorative design was utilised to evaluate students with DS's literacy experience from their educators' perspective. Fifty-eight educators of students with DS were involved in the study. The researchers use *Chi-square* testing to analyse the collected data and identify similarities and differences between the different sectors and schooling levels. The study identified that students with DS could achieve a monoliterate or biliterate reading level in Malta. Results also shed light on the different literacy training practices. Not all educators were aware of the students' skills and difficulties and that such knowledge could contribute to better literacy intervention planning. The results have several educational implications, such as training for all educators in managing children with DS in the educational setting in relation to literacy intervention techniques and bilingualism. Results also highlight the importance of providing bilingual exposure to Maltese students with DS.

Keywords: Down Syndrome, School Literacy Experiences, Literacy Intervention, Learning Support

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## Introduction

Children with Down Syndrome (DS) in Malta avail themselves of many early intervention services. Early Childhood Intervention Services (ECIS), Educators, Speech-language pathologists (SLPs), and Occupational therapists actively promote early literacy and literacy skills and share common goals. The Maltese public sector offers all these services through national insurance coverage. Children are also supported by various non-governmental organisations (NGOs) and private practice services. All services also move on towards implementing their goals in a school setting. Collective decisions are taken during *Individualised Educational Plan* meetings, and future therapeutic plans are drawn up. Each plan is individualised, and different goals are shared between professionals. The teachers and Learning Support Educators (LSEs) implement literacy training and instruction in a school setting coordinated by the school Inclusion Coordinator. In Malta, most children with DS are educated in a mainstream setting, in line with international practices (Burgoyne, 2009). However, an evidence-based literacy intervention strategy for children with DS is, to date, still not clearly stated.

Næss et al. (2012) discuss that sight word reading has often been prioritised in DS, influencing language and vocabulary. Such training could include the repeated use of familiar or 'useful' words that could be functional for the individual daily use. Children with DS have predominantly been exposed to a visual method of reading (Lemons & Fuchs, 2010). This trend has been mostly brought about by the acclaimed visual strengths of children with DS, the difficulties in auditory short-term memory, and claims that children with DS find it difficult to develop PA skills (Cossu et al., 1993). The latter is considered an important precursor to reading development. However, a shift in the more recent literature supports other reading instruction methods.

Scaffolded or mixed-method reading instruction is currently being encouraged (Goetz et al., 2008; Lemons & Fuchs, 2010; Muscat & Grech, 2023). Buckley (2003) maintained that pre-schoolers should first be introduced to a visual method of reading. Once the child acquires word recognition of around 40 flashcards by sight, they should be introduced to a reading instruction phonic method. Reading methods with an increased phonological component are increasingly being implemented. Goetz et al. (2008) maintain that an intervention method, which includes teaching word recognition and decoding abilities and training PA, is very useful for this population. Bayliss and Snowling (2012) found that a training program involving alphabet instruction, letter-sound activities, word and shared book reading and comprehension skills improves letter knowledge. While a program involving both language and literacy intervention by Burgoyne et al. (2012) indicates that individuals with DS benefit from an approach that taught reading and phonics, including a language component in which vocabulary and expressive skills training are incorporated. Yet the element of individual variability is a common trait amongst these studies. Variation in reading acquisition in DS has been reported extensively, e.g. (Burgoyne, 2009; Bird & Chapman, 2011; Robles-Bello et al., 2020). Variability can depend on the children's characteristics and the method and frequency of reading instruction (Goetz et al., 2008; Robles-Bello et al., 2020; King et al., 2020).

In summary, research about reading intervention studies identifies that children with DS benefit from PA training (Lemons et al., 2017, 2018; Næss, 2015) and that PA progresses as reading increases. Some studies also identified that letter knowledge predicts reading (Steele et al., 2013). Most studies recognised the importance of a mixed modality and holistic approach to reading instruction (Burgoyne, 2009, Burgoyne et al., 2012). Intervention methods with easy-

to-follow instructions, high visual elements, and less reliance on expressive verbal skills could positively impact literacy development (Loveall et al., 2021). However, inconsistency and variation between groups have also been noted, possibly due to the individual variability of participants.

An evaluation of the local Maltese community is missing. To date, no specific investigation of how Maltese children with DS are exposed to literacy training is available. The need is highly felt, particularly with Maltese having a shallow orthography, since reading acquisition could differ from that of languages with varying orthographic depths. Investigating the Maltese scenario will also shed light on intervention methods within a bilingual setting. A gap in the literature exists in this area; to the author's knowledge, no studies investigating bilingual literacy intervention with individuals with DS in Malta have been published to date.

### Research Questions

This study aims to answer the following research questions:

- Research Questions 1:** What literacy practices are used with children and adolescents with Down Syndrome in a Maltese school setting?
- Research Questions 2:** Can a difference in practices be identified between different school settings and school levels?
- Research Questions 3:** How does the bilingual context affect the school literacy environment and literacy practices when working with Maltese children and adolescents with Down Syndrome?

### Participants

Fifty-eight (58) educators participated in this study. Each educator had at least one student with DS in the classroom. The researcher invited educators, which were both teachers (24.6%) and Learning Support Educators (LSEs) (72.4%), to participate in the study. The data were collected through an online questionnaire distributed to all schools in Malta. Refer to Appendix A p. for the questionnaire. The principal researcher approached all 280 registered schools in Malta and asked the Heads of Schools to distribute the questionnaires to their staff if they had a student with DS within their school. The educators were asked to respond to the questionnaire according to the student they were following at the time. A resource centre is not considered mainstream as it allows students to have specialised educational experiences. A national statistic about the distribution of students with DS within the different schooling systems is currently unavailable. (NSO, personal communication, 2022). Table 1 represents information about the students. Table 2 illustrates the distribution of the participants across the different school settings.

**Table 1:** *Information about the students with DS*

School Level of Student	School Level of Student		Age of Student		
	<i>N</i>	Percentage	<i>N</i>	Percentage	
Early Years (KG2- Year1)	8	13.8%	3 years - 5 years	9	15.5%
Primary Years (Year 2- Year 6)	21	36.2%	6 years - 8 years	8	13.8%
Middle School (Year 7-8)	5	8.6%	9 years - 11 years	15	25.9%
Senior School (Year 9-11)	19	32.8%	12 years - 14 years	10	17.2%
Resource Centre: Secondary Years	5	8.6%	14 years +	16	27.6%

**Table 2: Mainstream Setting of Students with Down Syndrome**

	Does the student participate in a mainstream setting?		The proportion of school hours in mainstream			
	<i>N</i>	Percentage		<i>N</i>	Percentage	
<i>Yes</i>	47	81%	Less than 20%	11	19%	
<i>No</i>	9	15.5%	20 %	10	17.2%	
<i>Mainstream in a Resource Centre</i>	2	3.4%	40 %	10	17.2%	
			60 %	9	15.5%	
			80 %	11	19%	
			100%	7	12.1%	

## Results

The data were analysed using the IBM SPSS Statistics 25 software. Differences between groups are analysed through Chi-Square Testing. The results are presented in 4 sections; Language Abilities, Reading and Writing Skills, Reading and Writing Instruction; Use of Technology for literacy exposure.

### *Language Abilities*

The educators' awareness of the students' language and language-related skills and explored the bilingual aspect of students with DS in the Maltese school setting were explored next.

The use of spoken English (40%) at school was more predominantly reported when compared to Maltese (28%). However, a substantial proportion of students used both languages (3%). These results are summarised in Table 3. Educators were also asked about the students' hearing abilities. 10.3% reported that the student had hearing difficulties, 75.9% reported no hearing difficulties, and 13.8% said that they were not aware of the hearing abilities of the student.

**Table 3: The predominant spoken language**

	Predominant Language at School		Predominant Language at Home		
	<i>N</i>	Percentage	<i>N</i>	Percentage	
<i>Maltese</i>	16	28%	<i>Maltese</i>	27	47%
<i>English</i>	23	40%	<i>English</i>	21	37%
<i>Both</i>	19	33%	<i>Both</i>	6	10%
			<i>I don't know</i>	4	7%

All educators reported a level of bilingualism by the students. The educators reported different levels of language use between Maltese and English, with a greater proportion of English use reported. Consequently, the difference between the language used at school was tested across school types, revealing no difference in language use between school types (Table 4).

**Table 4: Spoken language proportion by bilingual students**

Question: If both languages are used at school, can you give an estimate of the use of each language?

	N	%
50% Maltese 50% English	11	19.0%
60% Maltese 40% English	8	13.8%
60% English 40% Maltese	6	10.3%
70% Maltese 30% English	4	6.9%
70% English 30% Maltese	4	6.9%
80% Maltese 20% English	10	17.2%
80% English 20% Maltese	15	25.9%

Results related to the spoken language of the participants at school are presented in Table 3. A *Chi-square* analysis indicated no difference in the responses according to the type of school (see Table 5).

**Table 5: Language spoken within the school setting**

The language during Literacy Instruction <sup>1</sup>			Choice of Language of Literacy Instruction <sup>2</sup>		
	N	Percentage		N	Percentage
<i>Maltese</i>	10	17.2%	During an IEP	28	48.3%
<i>English</i>	24	41.4%	By the Teacher	5	8.6%
<i>Both</i>	24	41.4%	By the Parents/Guardians	23	39.7%
			<i>Missing responses</i>	2	3.4%

Note: <sup>1</sup> $\chi^2(1) = 9.86; p = .131$ ; <sup>2</sup> $\chi^2(1) = 3.67; p = .721$

### Reading and Writing Skills

A set of questions investigated the students' reading attainment levels as reported by the educators. The educators were primarily asked whether their students were assessed specifically for reading abilities by an Educational Psychologist, an SLP or a Literacy Specialist. 50% of the educators reported that an assessment report was available, 19% responded negatively, and 31% were unaware of an assessment.

The students' level of letter recognition and letter-to-sound correspondence are presented in Table 6. Further analysis investigated whether this response differed according to the students' school year. A *Chi-square* analysis revealed no difference between school years (refer to note).

**Table 6: Letter Recognition**

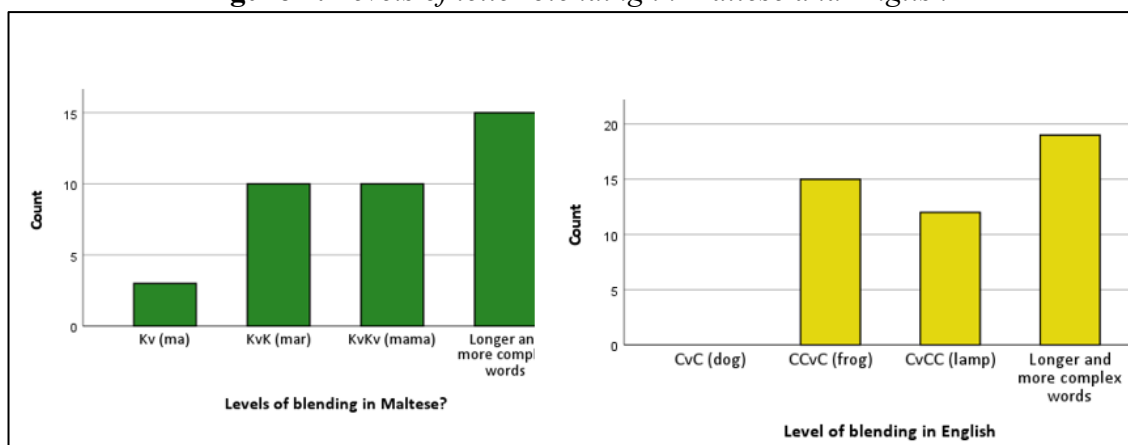
Letter Recognition in Maltese <sup>1</sup>			Letter Recognition in English <sup>2</sup>		
	N	Percentage		N	Percentage
Not yet	12	20.7%	Not yet	4	6.9%
Has Sometimes	6	10.3%	Has Sometimes	0	0
Occasionally	6	10.3%	Occasionally	7	12.1%
Often	10	17.2%	Often	8	13.8%
Usually always	24	41.4%	Usually always	39	67.2%

Note: <sup>1</sup> $\chi^2(1) = 21.43; p = .162$ ; <sup>2</sup> $\chi^2(1) = 10.44; p = .577$

The levels of letter blending were investigated in both languages. A substantial number of students with DS were reported to be able to blend complex letters to words in both languages (Figure 1). The *Chi-Square* analysis did not reveal any difference between school levels on blending in English; however, a difference in responses between school levels was found in

the Maltese sample  $\chi^2 (1) = 23.45; p = .005$ . A post-hoc analysis allowing for Type 1 Error Bonferroni correction identified that a 0% was reported in the group of students within the Primary level of education on blending consonant-vowel-consonant-vowel words. This result was statistically significantly smaller ( $p=.0019$ ) than other group years. Throughout other school levels, the distribution was more even.

**Figure 1: Levels of letter blending in Maltese and English**



Sentence and paragraph reading was investigated in both Maltese and English (see Table 7). A *Chi-square* investigation reveals no difference between school settings in these responses.

**Table 7: Reported Reading Levels**

	Reading Level							
	Sentences in English <sup>1</sup>		Sentences in Maltese <sup>2</sup>		Paragraphs in English <sup>3</sup>		Paragraphs in Maltese <sup>4</sup>	
	N	%	N	%	N	%	N	%
Yes	42	72.4%	21	36.2%	28	48.3%	15	25.9%
No	16	27.6%	37	63.8%	30	51.7%	43	74.1%

Investigating the responses related to the students' reading comprehension level reveals a variability among the students. Most educators responded that the students could comprehend short phrases in both languages. A higher proportion of educators reported that the students found it difficult to comprehend the meaning of words in Maltese (27.6%) compared to English (8.6%). Several educators also mentioned that they were not aware of the level of reading comprehension of their students, and this was most evident in Maltese (12.1%) compared to English (3.4%). Results are presented in Table 8.

**Table 8: The reported level of Reading Comprehension**

*What level of Reading Comprehension does the student have?*

	Maltese		English	
	N	%	N	%
Difficulty in understanding the meaning of written words.	16	27.6%	5	8.6%
Understands the meaning of single words	8	13.8%	9	15.5%
Understands the meaning of short phrases	12	20.7%	18	31.0%
Understands the meaning of short paragraphs	9	15.5%	16	27.6%
Understands the meaning of a long text	6	10.3%	8	13.8%
I do not know the level of reading comprehension	7	12.1%	2	3.4%

Independent book reading was next explored. The educators reported difficulty in the area where most students could not read books independently in both Maltese and English. Poor engagement in pretend reading was also reported. Results are summarised in Table 9. A *Chi-square test* tested did not identify a difference between school settings.

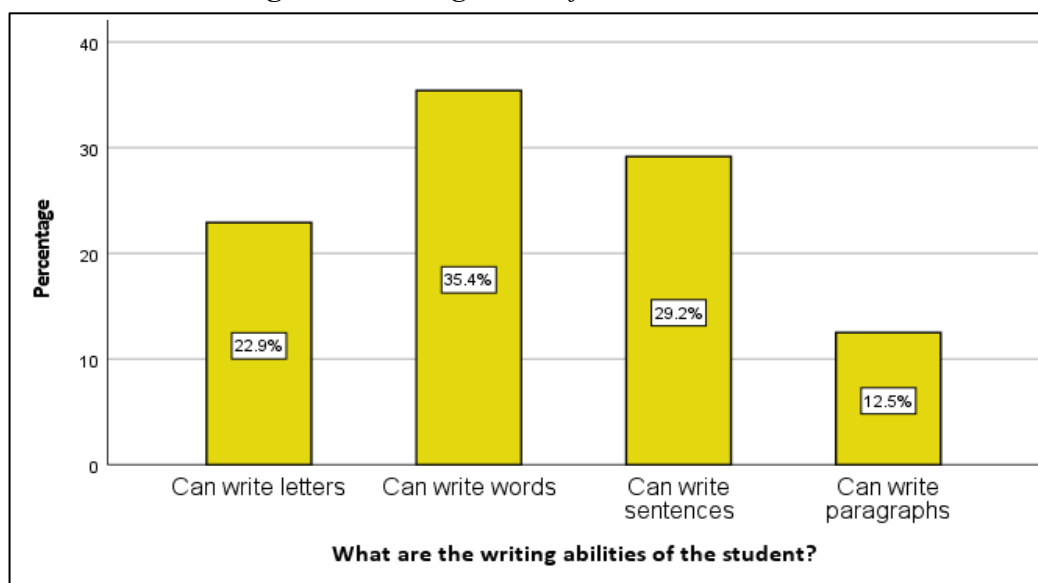
**Table 9: Independent reading and Pretend reading**

	Independent Reading Maltese <sup>1</sup>		Independent Reading English <sup>2</sup>		Pretend Reading <sup>3</sup>	
	N	%	N	%	N	%
Yes	12	20.7%	18	31%	18	31%
No	46	79.3%	40	69%	40	69%

Note: <sup>1</sup>  $\chi^2 (1) = .918; p = .821$ ; <sup>2</sup>  $\chi^2 (1) = 1.933; p = .586$ , <sup>3</sup>  $\chi^2 (1) = 5.204; p = .157$

Three questions investigated the writing abilities of students. Students were reported to possess different levels of writing abilities. 36.2% of the students were reported to be able to write Independently. 43.1% were also reported to write using several writing aids such as flashcards, computers, and tablets. 20.7% were reported to be unable to write. 8.6% of the students were reported to write in Maltese, 63.8% in English and 13.8% in both languages. The different levels of writing abilities are reported in Figure 2. No difference according to the school setting or the school level was identified.

**Figure 2: Writing levels of students with DS**



Note: <sup>School Setting</sup>  $\chi^2 (1) = 11.96; p = .216$ ; <sup>School Level</sup>  $\chi^2 (1) = 11.48; p = .488$ .

**Reading Instruction and Writing Instruction**

A set of questions investigated reading and writing instruction with students with DS. Educators reported that 56.9% of the students received additional help during reading exercises, and the LSE provided 43.1% of the time. Most educators reported that challenges are evident during reading instruction (72.4%). Results of questions investigating the frequency of participation in literacy lessons indicate that many educators reported that the students Never or Rarely Participated in literacy lessons (43.1%). In contrast, most students have between 1 and 2 hours of weekly literacy training (39.7%). Results are summarised in Table 10.

**Table 10: Participation in Literacy Activities**

Frequency of participation in activities relating to reading instruction in the classroom?			How much time per week is dedicated to literacy activities?		
	<i>N</i>	Percentage		<i>N</i>	Percentage
Never/rarely participates	25	43.1%	Less than 30 minutes a week	13	22.4%
Occasionally participates	16	27.6%	Between 1-2 hrs a week	23	39.7%
Participates sometimes	6	10.3%	3 -4 hrs a week	12	20.7%
Participates often	10	17.2%	More than 4 hrs a week	9	15.5%
<i>Missing</i>	1	1.7%	<i>Missing</i>	1	1.7%

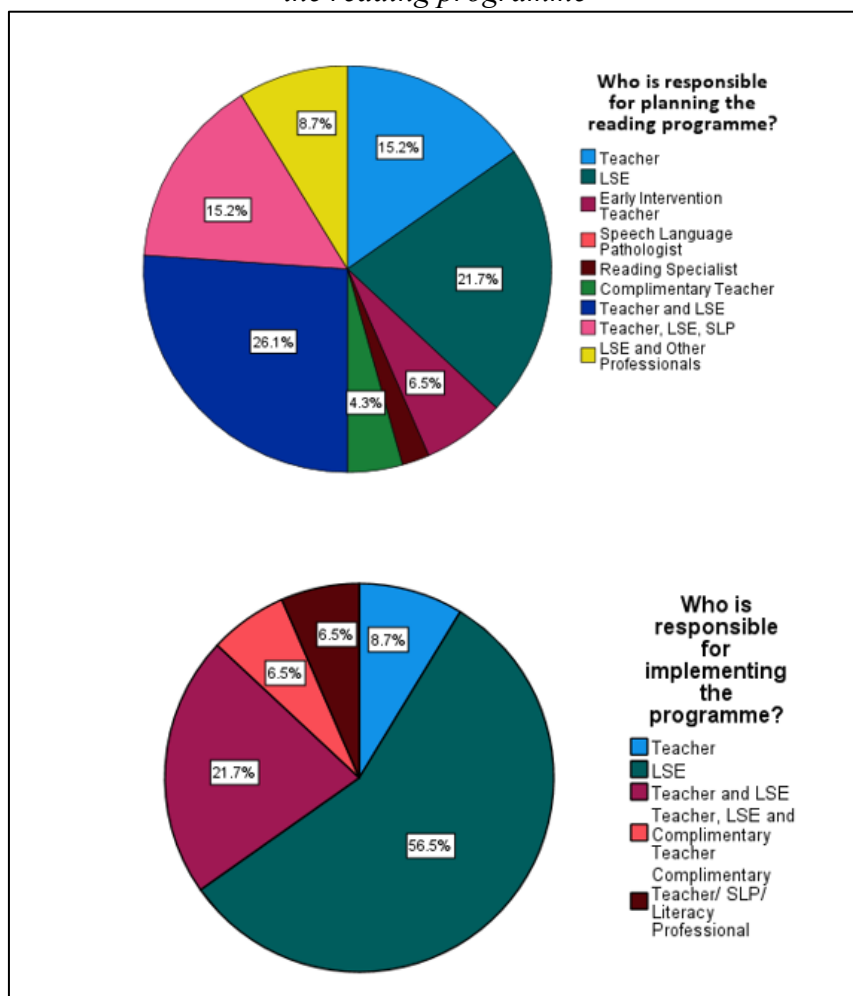
It is common practice in Maltese schools to assign books for home reading; educators in this study report that 48.3% of the students with DS were rarely given reading books at home. Educators reported that 48.3% of the students did not follow an alternative reading programme when investigating the type of reading instruction; however, 43.1% did (see Table 11).

**Table 11: Home Reading and Alternative Reading Programme results**

Does your student take reading books home from school for home practice?			Does the student follow an alternative reading programme?		
	<i>N</i>	Percentage		<i>N</i>	Percentage
Never/rarely	28	48.3%	Yes	25	43.1%
Occasionally	12	20.7%	No	28	48.3%
Once a week	8	13.8%	Total	53	91.4%
Several times a week	5	8.6%	<i>Missing</i>	5	8.6%
<i>Missing</i>	5	8.6%			

Results investigating the planning and implementation of reading instruction identify that the teachers and LSEs cooperate mostly and are responsible for planning reading instruction. Other professionals, such as SLPs, are also actively involved in planning. On the other hand, the implementation of reading instruction was primarily the responsibility of the students' LSEs (see Figure 3).

**Figure 3:** Professionals who are responsible for the planning and implementation of the reading programme



The type of reading methods was also investigated. Results are represented in Table 12.

**Table 12:** Educators' responses on the methods of reading instruction

What method of reading instruction is used with the student?	N		%		In your opinion, what is the best method for reading instruction for students with Down Syndrome?	N		%	
Phonic Method	10	17.2%	Phonic Method	6	10.3%				
Look and Say (using flashcards)	12	20.7%	Look and Say (using flashcards)	15	25.9%				
Both Methods	29	50.0%	Both Methods	33	56.9%				
Missing	7	12%	Missing	4	6.9%				

Questions related to writing instruction identified that the highest proportion (29.3%) of students Never or Rarely participated in writing activities, and between 1 to 2 hrs per week (37.9%) is mostly spent on writing instruction. Most educators also reported that students do not participate actively in writing activities (53.4%), (see Table 13).

**Table 13: Educators' responses on Writing Instruction**

Does your student participate in activities relating to writing activities in the classroom?			How much time is spent on writing activities?	
	N	%	N	%
Never/rarely	17	29.3%	Less than 30 min a week	13 22.4%
Occasionally	10	17.2%	Between 1-2 hrs a week	22 37.9%
Weekly	9	15.5%	3-4 hrs a week	11 19.0%
Several times a week	6	10.3%	More than 4 hrs a week	6 10.3%
Daily / Several times a day	10	17.2%	Missing	6 10.3%
Missing	6	10.33%		

A *Chi-Square analysis* tested whether the responses to questions within the Reading and Writing Instruction section were influenced by either the school setting or the school level. Following post-hoc testing, results showed that two questions were affected by the school year but had no effect on the responses by the school setting (see Table 14).

**Table 14: Questions identifying a significant Effect of School year variable on Reading and Writing instruction**

Question	Chi-Square Value	p-value
Are there activities related to reading instruction your student does not participate in?	10.975	.027 <sup>1</sup>
In your opinion, what is the best method for reading instruction for students with Down Syndrome?	21.674	.006 <sup>2</sup>

Note: <sup>1</sup> Bonferroni Corrected  $p = .0002$ : the group of students within a primary level of education were exposed to a significantly larger number of literacy hours

<sup>2</sup> Bonferroni Corrected  $p = .0001$ : the group of educators within the Early years level of education maintained that the Phonics Method was the best in their opinion

## Technology

The use of technology in reading and writing was examined. The educators maintained that only 44.8% of the students use the computer for literacy training; however, 65.5% of the educators reported using the device for other educational activities. See Table 15 for full results. *Chi-Square analysis* revealed no effect on the responses by either the school setting or school level.

**Table 15: Educators' responses on the use of technology in the classroom**

	Does the student have a computer in class? <sup>1</sup>		Does the student use the computer for literacy training? <sup>2</sup>		Does the student use a tablet in class? <sup>3</sup>		Is the computer used for other educational activities? <sup>4</sup>	
	N	%	N	%	N	%	N	%
Yes	36	62.1%	26	44.8%	21	36.2%	38	65.5%
No	21	36.2%	29	50%	36	62.1%	15	25.9%
Missing	1	1.7%	3	5.2%	1	1.7%	5	8.6%

Note: **Chi-Square Evaluation School Setting** <sup>1</sup> $\chi^2(1) = 1.442$ ;  $p = .696$ ; <sup>2</sup> $\chi^2(1) = 2.993$ ;  $p = .393$ , <sup>3</sup> $\chi^2(1) = 2.588$ ;  $p = .460$ , <sup>4</sup> $\chi^2(1) = .580$ ;  $p = .901$

**Chi-Square Evaluation School Level** <sup>1</sup> $\chi^2(1) = .572$ ;  $p = .966$ ; <sup>2</sup> $\chi^2(1) = 1.670$ ;  $p = .796$ , <sup>3</sup> $\chi^2(1) = 5.836$ ;  $p = .212$ , <sup>4</sup> $\chi^2(1) = 3.162$ ;  $p = .531$

## Discussion

The initial questions in the questionnaire allowed the researcher to understand better the literacy levels achieved by students with DS and placement within the Maltese educational system. An investigation of the students' reading abilities showed that students with DS could complete various reading skills. Many students recognise letters, blend complex words, read words, and read sentences. The ability of students to read paragraphs is also reported; however, a decline in the proportion can be observed. This shows great variability and agrees with the literature (Burgoyne, 2009; Bird and Chapman, 2011; Robles-Bello et al., 2020). It has been reported that variability can vary according to intrinsic student characteristics and the method and frequency of reading instruction (Goetz et al., 2008, Robles-Bello et al., 2020, King et al., 2020). Albeit the complexity involved in independent book reading, students with DS were also reported to engage in this type of reading. This shows that many students with DS can develop complex reading abilities.

Large variability was also reported concerning reading comprehension. Most educators reported that students could comprehend the meaning of written single words. However, comprehension abilities declined as the complexity of the texts increased, which supports previous research (Cupples & Iacono, 2000). Refer to Table 6. An interpretation from the Simple View of Reading perspective allows the researcher to assert that a proportion of the population of students have appropriate abilities in the two main components of the reading framework, where students can develop both word recognition and reading comprehension. The RQs are specifically evaluated next.

### ***Research Question 1: What Are the Literacy Practices Used With Children and Adolescents With Down Syndrome in a Maltese School Setting?***

The educator must be aware of the student's abilities to ensure that a student is provided with an individualised literacy experience. Unfortunately, this investigation revealed that not all educators know the students' skills. 7% were unaware of the language used in the student's home, 13.8% do not know the student's hearing abilities, 31% were unaware whether a literacy professional/s had formally assessed the student, and 12.1% did not know the level of reading comprehension of the student with DS in their class. While it has been reported that several educators are aware of the students' abilities, it is worrying that such a proportion of educators does not. This is not conducive to preparing an individualised literacy programme for the student. The lack of knowledge about the abilities of students with additional needs has often been reported in the literature, with teachers reporting being frustrated as this lack of knowledge does not help them to support the students successfully (McFadden, 2014; Giel-Romo, 2014; Fannan, 2017).

56.9% of the students were reported to be given additional help during literacy activities. However, only 43.1% are provided with an alternative literacy programme. This could be because many students can cope well with the mainstream literacy curriculum. However, only 12.1% are reported to follow a full mainstream curriculum. Variability between students was observed again; hence, individualised educational services for students with DS are extremely important. On an international level, it has been reported that including students with DS in a mainstream setting is increasingly standard practice in middle and high-income countries (Faragher & Clarke, 2014). This is concurrently reported in the Maltese school setting. The majority of students with DS attend mainstream education. However, some individuals move to Resource Centres in the secondary years of schooling. Secondary schools in Malta are highly

geared towards academic subjects, and students with learning difficulties often find it difficult to cope and have their needs adequately addressed.

Educators were asked what type of literacy instruction was mostly used with the students (see Table 10). A substantial number of educators still favoured the look-and-say method; however, this was not the majority of cases. Most educators reported that a balance between a *visual approach* to reading and a *phonic approach* is mostly implemented. Such a finding complements suggested practices, favouring a mixed modality approach over one specific approach (Burgoyne, 2009; Burgoyne et al., 2012). This study shows the importance of training to educators, which can help educators identify each student's strengths and work around the student's abilities.

The teacher should be the primary educator responsible for a student's educational journey and be assisted by a Learning Support Educator (LSE) (National Minimum Curriculum Framework, 2016; Faragher et al., 2020). However, results from this study highlight that the LSE was the primary educator for students with DS. It has been reported that the Teacher and LSE work together to plan and implement a reading programme (21%). However, since most students spend a proportion of time outside the mainstream setting, it is the responsibility of the LSE to implement any individualised intervention outside the classroom. This has been similarly reported in the literature (Lorenz, 1998; Faragher et al., 2020). It has also been reported that this practice might lead students with learning difficulties to receive training and explanations more from an LSE than from a teacher (Faragher et al., 2020).

The overt reliance on additional adult support apart from the teacher can also have social ramifications. The proximity of the adult can prevent peers from integrating the student within a peer group relationship while also preventing the student with difficulties from relying on the peers themselves (McFadden, 2014). This has been reported as an increased barrier between students with DS and peers due to the increased detachment from peer groups (McFadden, 2014).

The researchers inquired about what happens when the LSE is absent during the day and how the students perform. The amplified reliance on the LSE removes the student from the classroom experience, promoting increased reliance, even when unnecessary. This has been associated with a declining willingness to engage in problem-solving activities (Wishart, 2000). If LSEs are given a big part of the educational responsibilities, are they adequately trained to deliver these services? Unfortunately, the answer to this question goes beyond the scope of this research.

### ***Research Question 2: Can a Difference in Practices Be Identified Between Different School Settings and School Levels?***

A *Chi-square* analysis identified that no questions were affected by the school setting (state/church/independent schools). Agius (2012) maintained that the school setting does not affect the literacy attainment of Maltese TD students. The current study adds to Agius (2012) by claiming that the school setting does not affect literacy attainment and literacy practices with Maltese students with DS. These results also imply that uniform services are offered to students across different settings. The National School Support Services provide the same services to all students with LD across Malta, irrespective of the school setting. This ensures that all students are provided with the same support opportunities. Such services could have contributed to uniformity across school settings.

It was also explored whether responses varied across school levels. Two significant findings were identified. Students with DS within a primary school setting have spent significantly more time on literacy training. During the early years of schooling, educators collaborate with other professionals to support the students in developing the building blocks of language, motor development, and other fundamental skills. Hence, as identified through this questionnaire, the focus is not on literacy in most cases. The importance of literacy training is then felt more during the primary years. Such a decision might be taken as a matter of priority, where educators and other professionals might decide that literacy training is not a priority during the early years or due to the students' abilities. Martin et al. (2009) also support this by maintaining that educators must prioritise intervention services; for example, early communication skills should be prioritised over word-identification skills. However, one might indirectly strengthen the other.

The importance of professional development has been a recurrent point of importance put forward by educators themselves to help them implement better teaching strategies (McFadden, 2014). The National Literacy Strategy (2014) encompasses that students with learning difficulties should be provided with multi-sensory learning strategies and that educators should be encouraged to follow continuous professional development courses to support students with learning difficulties. Unfortunately, the national strategy offers very broad guidelines, and hence it finally depends on the Heads of Schools and educators to follow the recommended training.

***Research Question 3: How Does the Bilingual Context Affect the School Literacy Environment and Literacy Practices When Working With Maltese Children and Adolescents With Down Syndrome?***

It has often been reported that individuals with DS have been limited and encouraged to use a single language by parents and professionals (Edgin et al., 2011; Bird et al., 2005). The uniqueness of the language scenario in Malta lends itself to a needed investigation of the ways the bilingual aspect affects literacy training and literacy acquisition of students with DS. The researcher's personal experience and results from all studies of this research show that Maltese individuals with DS can use two languages to varying degrees both at home and achieve a level of biliteracy.

A sizeable proportion of students has been reported to use both Maltese and English during school hours (33%); however, the majority were reported to use the English language (40%) more predominantly in the school setting when compared to Maltese (28%). The language proportion of the language used at school does not match the language used at home as reported by the educators. 47% of the students are reported to have Maltese as a home language, 37% English, and 10% use both. Such a finding supports Vella's (2013) study, where a similar pattern of language use was reported in TD children. On the other hand, when the language used during literacy instruction was investigated, educators reported that 41% of the students were exposed to predominantly English literacy training. In comparison, 41% were exposed to Maltese and English. Such a finding confirms that although different degrees of Maltese/English use and exposure is apparent at home and school, the National Minimum Curriculum, which emphasises teaching the two official languages, is being implemented for many students with DS.

Although a shift towards literacy training in English is observed, this is not greater than literacy training in both Maltese and English. Research about the language use in bilingual communities

of individuals with DS is lacking locally and internationally. Scriha (2001) reported a sentiment that English is more important than Maltese within the educational system was reported among TD children and is similarly reported here within the Maltese community of students with DS. However, the value of bilingualism is still as strong. Camilleri Grima (2013) reports that educators use a substantial amount of code-switching in the classroom. This is also confirmed in this study as different degrees of both Maltese and English are used with students with DS. No distinction between the school setting was reported by Camilleri Grima (2013) and confirmed in this study.

A second important finding is that all educators reported that all students were bilingual at school. Varying degrees were reported, with a greater proportion of English use being reported among the students.

### **Conclusion and Significant Findings**

This study revealed significant findings about the school literacy environment of Maltese students with DS. It has been reported that Maltese students with DS are predominantly educated within a mainstream setting. The LSE primarily meets the needs of students with DS, and the implications of such a finding have been discussed. Maltese students with DS are exposed to Maltese and English within the bilingual school setting. Results indicated that students with DS follow the National Minimum Curriculum recommendations. Biliteracy has been reported within the population of Maltese students with DS. Varying levels according to the individuals' abilities have been shown. This showcases the aspect of bilingualism in DS and the skills of students with DS to develop language and literacy abilities in both languages. A preference for the use of spoken Maltese in the home has been reported; however, English is favoured during school hours. Finally, it has been highlighted that a substantial proportion of students use a visual method of literacy training. However, a large proportion uses both a visual and phonic method concurrently.

This study provides novel data about bilingualism and biliteracy in Down Syndrome. This study is also the first to investigate literacy education for students with Down Syndrome within the Maltese educational system. Finally, this study calls for further training for educators. A student with Down Syndrome needs professional support to help them achieve the best of their abilities. This calls for educators to be updated with the latest research to ascertain that students are supported in the best possible way. Stakeholders need to invest in further training for all educators.

### **Limitations of the Study**

Some limitations to the study have been identified.

- Both teachers and LSEs were invited to respond to the questionnaire, and LSEs responded in greater proportion. This response could have contributed to an imbalance as the teachers' perspectives and LSEs were not proportional.
- Few respondents from Resource Centres were identified. An in-depth study within this setting could provide the researcher with additional novel findings since the educational interventions within resource centres are relatively unexplored.
- In-depth case studies could have yielded more detailed information about specific practices that are currently taking place in schools.

- The educators' level of education has not been explored. Such a finding could have contributed to better evaluate the results and their experience in teaching students with DS.
- A larger sample size could have contributed to better data generalisation.

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## Appendix A

### School Literacy Environments Questionnaire.

#### Section A

1. Consent to use this questionnaire for research purposes
  - Yes
  - No
  
2. What is your role with the student?
  - Class Teacher
  - Learning Support Educator
  
3. In what school setting do you teach?
  - Public School
  - Church School
  - Independent School
  - Resource Centre
  
4. Which school year does the student attend?
  - Early Years ( KG2- Year1)
  - Primary Years (Year 2- Year 6)
  - Middle School (Year 7-8)
  - Senior School (Year 9-11)
  - Resource Centre
  
5. How old is the student?
  - Enter Age
  
6. Does the student have difficulties with Hearing?
  - Yes
  - No
  - I am not aware of the hearing abilities of the student
  
7. Has the student been assessed for **reading/writing difficulties** by and Educational Psychologist or Literacy Specialist?
  - Yes
  - No
  - I am not aware of the assessment
  
8. Does your student participate in a mainstream classroom /school setting?
  - Yes
  - No
  
9. If yes, approximately what proportion of the average school day does this occur
  - 100%
  - 80%
  - 60%
  - 40%
  - 20%
  - <20%
  
10. Does your student attend a resource centre?
  - Yes
  - No
  - Attends Part-time
  
11. If none of these options appropriately apply to your student, please describe their situation here (e.g complimentary class for reading, reduced timetable) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  
12. What language does your student use?
  - Maltese
  - English
  - Both
  
13. What language does the student use at home?
  - Maltese
  - English
  - Both
  
14. In what language is literacy instruction carried out?
  - Maltese
  - English
  - Both
  
15. How was the language of instruction decided?
  - During an IEP
  - By the Teacher
  - By the Parents
  - Other: Specify \_\_\_\_\_

**Section B: Towards Independent Reading  
(reading by the child)**

16. Does your student participate in activities relating to reading instruction in the classroom?
1. Never/rarely
  2. Occasionally
  3. Weekly
  4. Several times/week
  5. Daily Several times/day

17. If yes, please describe what activities he/she participates in and the length of time he/she remains engaged.

\_\_\_\_\_

\_\_\_\_\_

18. How many lessons a week are dedicated to these activities?
- 1
  - 2
  - 3
  - 4 or more

19. If yes, what is the format of these activities relating to reading instruction? (circle all those that apply)
- Individual
  - small group
  - large group

20. Are there activities related to reading instruction your student does not participate in?
- Yes
  - No

21. If yes, please list them here. \_\_\_\_\_

\_\_\_\_\_

22. Why doesn't the student follow this type of reading instruction?

23. Does your student read books independently?
1. Never/rarely
  2. Occasionally
  3. Weekly
  4. Several times/week
  5. Daily Several times/day

24. Does your student pretend to read the story in a book, such as sitting with a book and producing speech that is similar to the actual story in the book?
1. Not yet
  2. Has but rarely Occasionally
  3. A few times/story
  4. Often during story Usually

26. Does your student take reading books home from school for home practice?
1. Never/rarely
  2. Occasionally
  3. Weekly
  4. Several times/week
  5. Daily Several times/day

27. Does your student receive extra help with his/her reading at school?
1. Never/rarely
  2. Occasionally
  3. Weekly
  4. Several times/week
  5. Daily Several times/day

28. If yes, what sort of help does she/he receive? \_\_\_\_\_

\_\_\_\_\_

29. If yes, who provides this support? \_\_\_\_\_

\_\_\_\_\_

30. List some resources that are used for reading instruction? \_\_\_\_\_

31. Are there challenges providing reading instruction for this student?
- Yes
  - No

32. If yes, please describe what the challenges are, as well as ways you find to manage them.

\_\_\_\_\_

\_\_\_\_\_

33. Does your student ask you how to spell words?
1. Never/rarely
  2. Occasionally
  3. Weekly
  4. Several times/week
  5. Daily Several times/day
34. Are there challenges providing spelling instruction for this student?
- Yes
  - No
35. If yes, please describe what the challenges are as well as ways you find to manage them. \_\_\_\_\_  
\_\_\_\_\_
36. Does the student follow an alternative programme for reading instruction?
- Yes
  - No
37. Who is responsible for planning the reading programme?
- Teacher
  - LSE
  - Early Intervention Teacher
  - Speech-Language Pathologist
  - Other: Specify \_\_\_\_\_  
\_\_\_\_\_
38. Who is responsible for implementing the programme?
- Teacher
  - LSE
  - Complimentary Teacher
  - Other: Specify \_\_\_\_\_
39. What method of reading instruction is used with your student?
- Phonic Method (for example sounding out the letter sounds)
  - Look and Say (using flashcards)
  - Both Methods
40. In your opinion, what is the best method for reading instruction for students with DS?
1. Phonic Method (for example sounding out the letter sounds)
  2. Look and Say (using flashcards)
  3. Both Methods

41. Does your student recognise letters of the alphabet? (such as pointing to the letter "A" when you ask him/her to?)
1. Not yet
  2. Has but rarely
  3. Occasionally
  4. Often
  5. Usually Always
42. Do you attempt to teach the names of letter in the alphabet and/or alphabet sounds when reading?
1. Not yet
  2. Have but rarely
  3. Occasionally A few times/story
  4. Often during story Usually
- during other activities?
    1. Not yet
    2. Have but rarely
    3. Occasionally
    4. Few times/story
    5. Often during story
    6. Usually

**Section C: Writing**

43. Does your student participate in activities relating to writing activities in the classroom?
1. Never/rarely
  2. Occasionally
  3. Weekly
  4. Several times/week
  5. Daily Several times/day
44. If yes, please describe what activities he/she participates in and the length of time he/she remains engaged.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
45. If yes, on average, how many hours per week?  
\_\_\_\_\_
46. Are there activities related to writing instruction your student does not participate in?
- Yes
  - No
47. If yes, please list them here.  
\_\_\_\_\_  
\_\_\_\_\_

**Section D: Technology**

48. Do you have a computer in the classroom?

- Yes
- No

49. If so, does your student use it?

- Yes
- No

50. Average number of hours per week?

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51. What computer programmes does he/she enjoy?

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**Section E: Conclusion**

52. If you have any further comments you would like to make, please do so here.

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