GAS Journal of Arts Humanities and Social Sciences (GASJAHSS)

Volume 3, Issue 3, 2025 Homepage: https://gaspublishers.com/gasjahss/ ISSN: 3048-5002
Email: contact@gaspublishers.com

Which Factors are Significant for Bilingual Students to Improve in Written Production?

Chrysovalantou Kapeta

Postdoctoral researcher, Aristotle University of Thessaloniki-Greece

Received: *25.05.2025* | ***Accepted:*** *28.05.2025* | ***Published:*** *30.05.2025*

***Corresponding Author:** *Chrysovalantou Kapeta*

DOI: *10.5281/zenodo.15552075*

Abstract **Original Research Article**

Bilingualism often affects early-age students in written production as their mother tongue interferes. The purpose of this research is to identify the variables that may influence the readability grade of texts produced by a Greek origin bilingual student through tests from the 2nd- 5th grade of German elementary school. For this reason, 39 out of 150 samples were collected, digitized through Word software and analyzed with the readability formulas Flesch-Kincaid and Gunning Fog. The results of this analysis were then transferred to an Excel spreadsheet. The data were statistically analyzed using Tableau. The results of the study showed that at these ages, bilingual students seem to have some difficulties to develop vocabulary related to the disciplines of Geography, Biology or/and History. Unusual words that are not included in the everyday vocabulary of a primary school student also seem to present e.g. spelling errors or confusion of concepts. The same phenomenon is observed in multi-syllabic words or in words that are difficult to pronounce or memorize in the German language regarding a bilingual student. In conclusion, the degree of difficulty and the final grade of a test depends quite a lot on the above elements. Their frequent and correct use would perhaps increase the readability grade. These variables should be taken into account by every teacher, while the construction of digital readability measurement tools is recommended for a more reliable assessment towards bilingual students. Finally, the creation of more specialized educational materials would likely contribute to the performance of bilingual students regarding written production.

Keywords: Readability, Primary School, Bilingualism, Written Production.

Citation: Kapeta, C. (2025). Which factors are significant for bilingual students to improve in written production? *GAS Journal of Arts Humanities and Social Sciences (GASJAHSS)*, *3*(3), 149 -155.

INTRODUCTION

Recent researchers focus on possible difficulties in integrating immigrant children into the school environment (Goodwin, 2017), as they appear to simultaneously face difficulties in their oral interaction with their classmates, since in some cases serious deficiencies in vocabulary are observed (Helot & Young, 2010).

The potential difficulty for a bilingual student of elementary school to correctly combine words in order to create a complete sentence (Nahatame, 2023), coherence between sentences, to form a flow, to write simple or even more complex monosyllabic or polysyllabic words without spelling errors (Bellocchi et al., 2017), to correctly inflect verbs by tense, person and number as in the German language, each factor, possibly combined together or individually, forms the profile of a bilingual student in the first grades of primary school (Kormi-Nouri et al., 2010). Therefore, the discovery of significant elements that influence the readability degree of texts is of high importance for research disciplines (Kapeta, 2020).

This study presents samples of written language production by a bilingual student across the spectrum of primary school education (Hambly et al., 2013). In other words, 39 samples from the 2nd grade to the 5th grade of a primary school in Germany located in Salzgitter Thiede are analyzed, with an emphasis on German language, while the mother tongue is Greek. Though the samples derive from the ‘80s, it is very interesting to investigate all those variables that used to have and continue to have an impact on written production by bilingual students at these early ages of primary school. Within these samples, important factors arise, which sometimes favor the bilingual student when producing simple words or sentences

up to more complex paragraphs, but sometimes have a negative effect when, due to age or due to bilingualism, vocabulary becomes confused or, for example, grammar rules are not applied correctly (Thordardottir, 2019).

These parameters are likely also present in spoken language, in which bilingual students are called upon to communicate with native speakers; a fact that perhaps leads them to hesitate to express themselves freely (Filippi et al., 2015).

Therefore, bilingual students hesitate to communicate with their classmates, fearing rejection, bullying (Vera et al., 2021), or misunderstanding if they do not express themselves adequately in the common spoken language which would be German in the present study.

On the other side, in written production, the above difficulties are probably more easily reflected as the bilingual student tries to apply and decode rules of grammar and syntax that he has assimilated in school (Steinlen, (2017). However, because similar rules are also introduced in his native language, he sometimes feels unsure by confusing the way he pronounces words or using vocabulary that is difficult for the student to remember (Beinborn et al., 2014).

Communication conditions become even more difficult when the student is simultaneously attending lessons in his mother tongue. In this study, the student begins short-term Greek language lessons in a Greek school from the second grade of the German primary school.

In conclusion, 39 samples from tests in a German school in the 1980s have been randomly selected and investigated, while the total number of tests/samples is 150.

The purpose of the research is to discover all the variables that make up the profile of a bilingual student, as he tries to form the most complete words, sentences and paragraphs possible based on the rules of grammar and syntax of German as the main language (Wischmeier, 2012), while also learning contemporarily the Greek language as second one (as mother tongue) within the family and the Greek school attending Greek lessons four hours per week.

By discovering these characteristics, it may be possible to identify the eases or difficulties of a bilingual student, so that even more adapt tests for bilingual students could be prepared in the future. The results might create a useful database for other scientists to delve deeper into all languages to create an international database on the factors that contribute more or less to written production by bilingual students. The main goal is a future production of educational material specifically intended for bilingual students in the early grades of primary school regarding their parallel support but also for more favorable teaching and learning conditions.

Research questions

At the beginning of this research, the main objectives of this study will be mentioned first of all regarding the reasons why this research was initiated:

1. Can a bilingual student confuse vocabulary or grammatical phenomena from his native language in the daily spoken language at school? If so, what are the factors that influence this result?
2. What factors may contribute to the more effective use of specific variables such as vocabulary, type of vocabulary, spelled words, correct declension of verbs and nouns, etc.?
3. Which variables influence more or less a primary school student whose mother tongue is different from the one in which he composes sentences or texts on a daily basis at school?
4. What are the difficulties or eases faced by a minor user of the first language (main language spoken at public school) while simultaneously being a user of his mother tongue?

On the other hand, the main objectives that will emerge at the end of the study could be the following:

- To find factors that could contribute to higher quality texts from user of the daily spoken language but having a different mother tongue.
- The investigation of grammatical, lexical, and syntactic features that influence the degree of readability during written production.
- Perhaps simplifying the topics and instructions for better understanding by users of a different native language and equal competition with native students within a multicultural learning environment.

In conclusion, collecting more results from similar studies could contribute to the construction of readability formulas such as Gunning Fog and Flesch-Kincaid (Kapeta, 2020) for a more objective, reliable and fair evaluation of tests (validity) in schools in order to assist also bilingual students and monolingual students simultaneously (Kapeta, 2020).

MATERIALS AND METHODS

Initially, it should be said that from a multitude of samples from the distant past of the 1980s-1990s, 39 samples out of 150 were selected at random during the first stage. The texts were taken from grades 2 to 5 of German elementary school and are sometimes single words, sentences or paragraphs, while all the productions are part of various tests.

The most difficult stage of the present research was the digitization of the samples in Word format, as well as the precise manual transfer of all data from Word to digital measurement platforms such as Flesch-Kincaid (Courtis & Hassan, 2002) and Gunning Fog. Even more difficult seemed to be the careful manual transfer of the results to the Excel table.

Moreover, the Excel table was introduced into the modern statistical analysis software Tableau, from which the last phase emerged, i.e. the final product of the present study, in terms of discovering the most important variables with which the general picture of a bilingual student can be formed. These variables determine the level of language proficiency and the readability grade in written language.

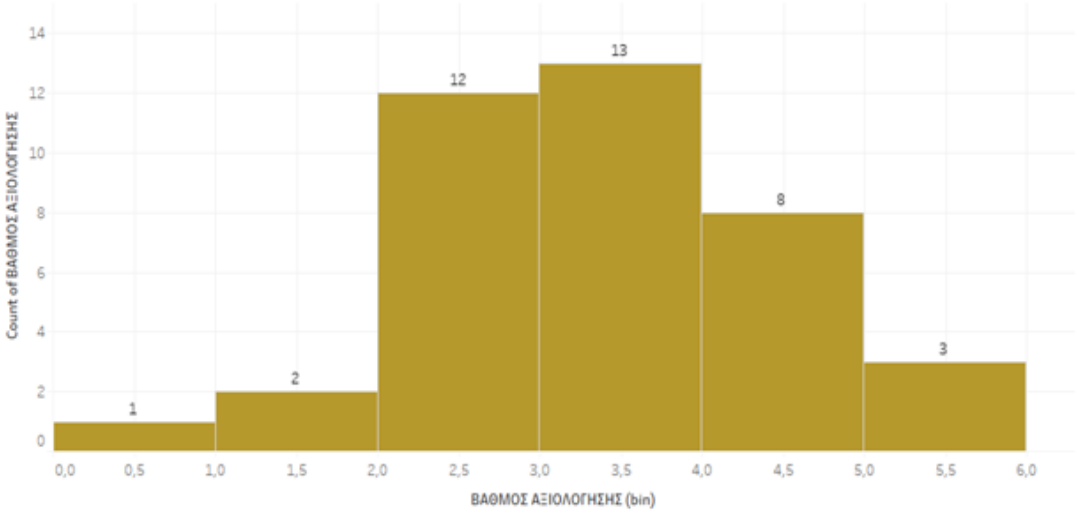
Table 1: *Research methodology*

1st phase: Sampling source	German school tests from primary school in Salzgitter Thiede-Germany
Chronological range of samples	1987-1991
Number of samples	39 out of 150 by random draw
Primary School classes surveyed	2nd-5th grade
2nd phase: Sample digitization tool	Word 10
3rd phase: Formulas used	Flesh-Kincaid, Gunning Fog Index
4th phase: Database import program	Excel
5th phase: Statistical analysis tool	Tableau
6th phase: Final product	Important factors

RESULTS AND DISCUSSION

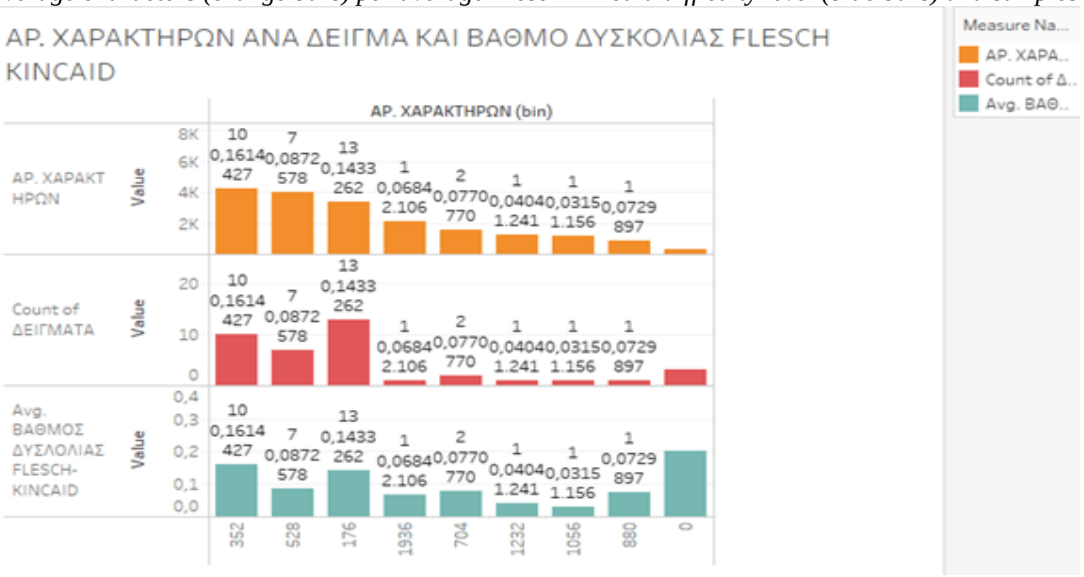
The German education system presents a grading scale from 1 to 6. Grade 1 represents excellence, while 6 represents poor performance. Based on this scale, we can see in graph 1 that most samples, 12 and 13 in total, display grades 2, 3 and 4. This is a very good result to average performance for a bilingual student at this age. Thus, in graph 1, three samples range between 5 and 6, i.e. very poor performance, while only 1 and 2 samples have reached the excellent and very good grades, respectively. In general, however, we might suppose that depending on age (8-10 years old) performance in written production can be described as quite good. This gives a positive picture of the overall performance which includes a range of factors, such as spelling, correct vocabulary use, average syllables, characters and words when thinking about the fact that this student uses Greek as mother tongue at home and German as daily language at school and with friends out of the school environment.

Graph 1: *Grade and evaluation scale of the German education system from 1-6 for 39 samples*



Regarding the average degree of difficulty of the Flesch-Kincaid index, a maximum percentage of 0.16% is observed in graph 2 in 10 samples and 0.14 in 13 samples with a total number of characters of 427 in the first case and 262 in the second. On the co ntrary, we observe in one sample 2106 characters but a difficulty level of 0.06%.

Graph 2: *Average characters (orange bars) per average Flesch-Kincaid difficulty level (blue bars) and samples (red bars)*



On the opposite, based on the **Flesch-Kincaid reading ease** table (table 2), the lower the percentage, the more difficult it is to read and it is intended for older readers as we see in the table below[1]:

Table 2: *Flesch-Kincaid Readability Scale*

Flesch reading ease [edit]

In the Flesch reading-ease test, higher scores indicate material that is easier to read, while lower numbers mark passages that are more difficult to read. The formula for the Flesch reading-ease score (FRES) test is:[7]

$$206.835 - 1.015\left(\frac{\text{total words}}{\text{total sentences}}\right) - 84.6\left(\frac{\text{total syllables}}{\text{total words}}\right)$$

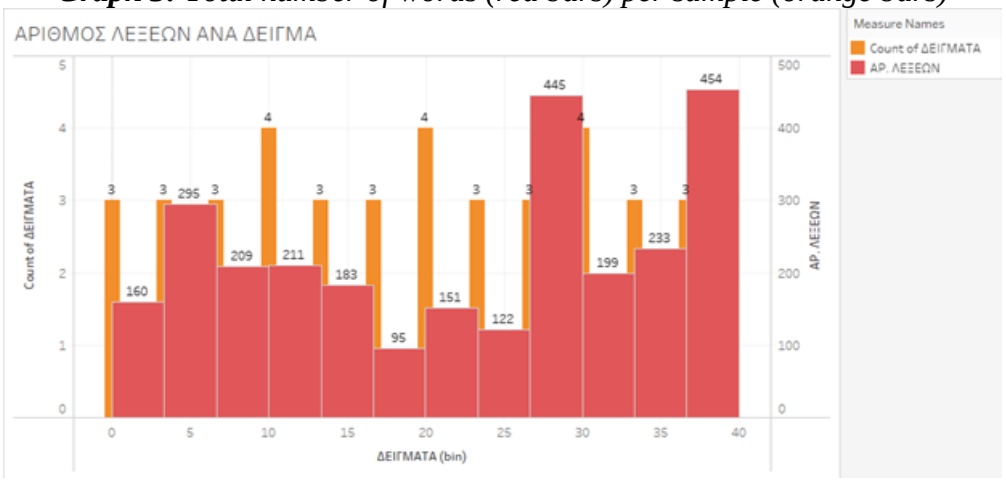
Scores can be interpreted as shown in the table below.[7]

Score	School level (US)	Notes
100.00–90.00	5th grade	Very easy to read. Easily understood by an average 11-year-old student.
90.0–80.0	6th grade	Easy to read. Conversational English for consumers.
80.0–70.0	7th grade	Fairly easy to read.
70.0–60.0	8th & 9th grade	Plain English. Easily understood by 13- to 15-year-old students.
60.0–50.0	10th to 12th grade	Fairly difficult to read.
50.0–30.0	College	Difficult to read.
30.0–10.0	College graduate	Very difficult to read. Best understood by university graduates.
10.0–0.0	Professional	Extremely difficult to read. Best understood by university graduates.

[1] [1] https://en.wikipedia.org/wiki/Flesch%E2%80%93Kincaid_readability_tests

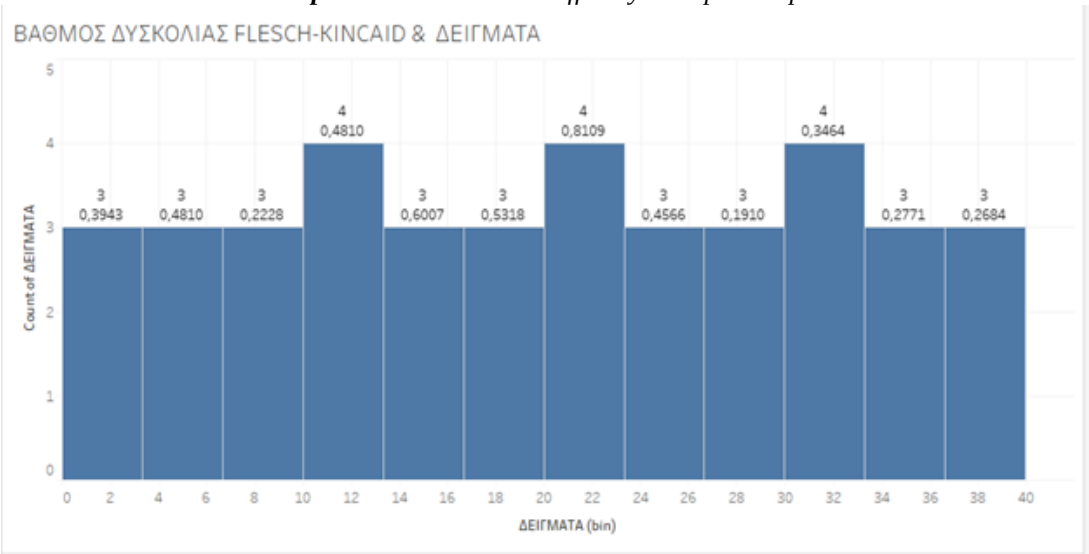
In graph 3, the samples are correlated by total number of words. Thus, in 3 produced texts on the right of the table, a total of 454 words are listed, while in only 3 samples we have a total of 95 words. However, it should be emphasized at this point that these are different samples, sometimes we are talking about sentences, words or entire paragraphs. Therefore, in some cases we have justifiable low amounts or percentages. The fact is that no samples smaller than 10 words are observed. Therefore, depending on the exercise in which the student was asked to develop his thinking, he used a sufficient number of words in relation to the age level. Samples 1, 4, 5, 7, 10, 13, 28, 29, 30, 34, 35, 37 and 39 include more characters than the rest; therefore a more increased amount of characters is reasonably obtained compared to the remaining samples.

Graph 3: *Total number of words (red bars) per sample (orange bars)*



Regarding the Flesch-Kincaid difficulty level, 4 samples display in graph 4 as the highest percentage 0.81%, another 4 display 0.48% and another four 0.34% compared to 3 that show 0.19%. All of these percentages, although they may seem low, indicate a fairly high degree of readability difficulty based on the Flesch-Kincaid scale. The final evaluation of the tests but also the readability grade, however, do not depend on the range of characters or words used, but on the way in which they are composed and produce correct words and sentences.

Graph 4: *Flesch-Kincaid difficulty level per sample*



General table 3 displays all the variables, where for example, in the 39 samples we notice an average of 3 spelling errors, an average Gunning Fog index of 0.2% and an average word count of 71%. These specific results might show the potential ease with which a first-language speaker of German can produce sentences and paragraphs with ease at the age of 7-10, even though his native language is Greek.

Table 3: *General table of all variables and the correlation between them from the top to the bottom (Average number of words, syllables, characters, evaluation, difficulty grade Flesh-Kincaid, final difficulty grade, easiness grade, count of samples in total, average index Gunning Fog, average of spelling errors)*

Count of Φύλλο1	39,0
Avg. ΑΡ. ΛΕΞΕΩΝ	70,7
Avg. ΑΡ. ΣΥΛΛΑΒΩΝ	116,6
Avg. ΑΡ. ΧΑΡΑΚΤΗΡΩΝ	487,5
Avg. ΒΑΘΜΟΣ ΑΞΙΟΛΟΓΗΣ..	2,9
Avg. ΒΑΘΜΟΣ ΔΥΣΚΟΛΙΑΣ..	0,5
Avg. ΒΑΘΜΟΣ ΔΥΣΛΟΛΙΑΣ..	0,1
Avg. ΒΑΘΜΟΣ ΕΥΚΟΛΙΑΣ ..	0,3
Count of ΔΕΙΓΜΑΤΑ	39,0
Avg. ΔΕΙΚΤΗΣ GUNNING F..	0,2
Avg. ΟΡΘΟΓΡΑΦΙΚΑ ΛΑΘΗ	3,1

In table 4, we see the Gunning Fog difficulty scale, according to which the lower the percentage, the more understandable and easier the text is to read. Therefore, looking from the bottom to the top, 6 represents 6th grade in elementary school, while 17 represents a university/college graduate.

Table 3: *Gunning Fog Difficulty Index*

Fog Index	Reading level by grade
17	College graduate
16	College senior
15	College junior
14	College sophomore
13	College freshman
12	High school senior
11	High school junior
10	High school sophomore
9	High school freshman
8	Eighth grade
7	Seventh grade
6	Sixth grade

CONCLUSION AND RECOMMENDATIONS

To recap, the main factors that influence the overall performance of a bilingual elementary school student but also the redability grade are as follows:

1. The more spelling errors the lower the readability grade.
2. The connection through the correct connectives and the coherence of words, s entences and paragraphs reduce the degree of ease but increase the readability grade.

3. The number of characters and syllables do not play the most important role regarding a high readability grade but if those are used in a right way (e.g. vocabulary without spelling errors, adapt vocabulary within a sentence), then, readability grade seems to display higher.
4. Vocabulary according to specific school subjects like History, Geography, Biology or Religion seem to display a high readability grade if they are written and used correctly within the contest.

Taking all these criteria into account, the teacher has the opportunity to adapt the lesson to bilingual students with supplementary educational material. This might help to further improve the understanding of the lesson or to improve the performance of bilingual students.

Based on this study, it would be reasonable to use new technology in the construction of tests for bilingual elementary school students for more reliable assessment.

Finally, future researchers could possibly collect similar data for other languages and school levels on a pan-European level, so as to create a common database. This would provide a more general picture of the difficulties or eases of bilingual students by language and language level. This could potentially yield even more specialized results on how to address difficulties in written production from the native to the spoken language.

REFERENCES

Beinborn, L., Zesch, T., Gurevych, I. (2014). Readability for foreign language learning: The importance of cognates. *ITL - International Journal of Applied Linguistics*, 165(2), 136-162. https://doi.org/10.1075/itl.165.2.02bei

Bellocchi, S., Tobia, V., Bonifacci, P. (2017). Predictors of reading and comprehension abilities in bilingual and monolingual children: a longitudinal study on a transparent language. *Springer Nature Link*, 30, 1311–1334. https://link.springer.com/article/10.1007/s11145-017-9725-5

Courtis, J. K., Hassan, S. (2002). Reading Ease of Bilingual Annual Reports. *International of Business and Communication*, 39(4). https://doi.org/10.1177/002194360203900

Filippi, R., Morris, J., Richardson, F. M., Bright, P., Thomas, M. S. C., Karmiloff-Smith, A., Marian V. (2015). Bilingual children show an advantage in controlling verbal interference during spoken language comprehension. *Bilingualism: Language and Cognition*, 18(3), 490 – 501. https://doi.org/10.1017/S1366728914000686

Goodwin, A. L. (2017). Who is in the Classroom Now? Teacher Preparation and the Education of Immigrant Children. *Journal of the American Educational Studies Association*. 53(5), 2017. https://doi.org/10.1080/00131946.2016.1261028

Hambly, H., Wren, Y., McLeod, S., Roulstone, S. 2013. The influence of bilingualism on speech production: A systematic review. *International journal of Languaage & Communication Disorders.* 48(1), 1-24. https://doi.org/10.1111/j.1460-6984.2012.00178.x

Helot, C., Young, A. (2010). Bilingualism and Language Education in French Primary Schools: Why and How Should Migrant Languages be Valued? *International Journal of Bilingual Education and Bilingualism*. 96-112. https://doi.org/10.1080/13670050208667749

Kapeta, C. (2020). *Criteria to determinate the level and difficulty of written production.* Doctoral thesis. http://hdl.handle.net/10442/hedi/48653

Kormi-Nouri, R., Moradi, A-R., Moradi, S., Akbari-Zardkhaneh, S., Zahedian, H. (2010). The effect of bilingualism on letter and category fluency tasks in primary school children: Advantage or disadvantage? *Bilingualism: Language and Cognition*, 15(2) , 351-364. https://doi.org/10.1017/S1366728910000192

Nahatame, S. (2023). Predicting processing effort during L1 and L2 reading: The relationship between text linguistic features and eye movements. *Bilingualism: Language and Cognition*, 26(4), 724 – 737.

Steinlen, A., K. (2017). The development of English grammar and reading comprehension by majority and minority language children in a bilingual primary school. *Studies in Second Language Learning and Teaching.* 7(3). 419-442.

Thordardottir, E. 2019. Amount trumps timing in bilingual vocabulary acquisition: Effects of input in simultaneous and sequential school-age bilinguals. *International Journal of Bilingualism.* 23(1). https://doi.org/10.1177/1367006917722418

Vera, E., Heineke, A., Daskalova, P., Schultes, A., K., Pantoja-Patiño, J., Duncan, B., Yanuaria, C., Furtado, C. (2021). Emergent bilingual high school students' social and emotional experiences. *Psychology in the schools.* 58(10). 1932-1961. https://doi.org/10.1002/pits.22559

Wischmeier, I. (2012). *Primary School Teachers' Beliefs about Bilingualism.* Retrieved 13/05/2025 from https://shorturl.at/zFkZe