

Virtual tools in the concept of reading of future teachers: a lexical exploration

Ferramentas virtuais na concepção de leitura de futuros professores: uma exploração lexical

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Abstract

New forms of reading have emerged recently, and virtual tools and environments have been developed to promote reading. Initial teacher training must be up to date to train good mediators. Therefore, this research analyses the presence of digital tools in the concept of reading of future teachers. The data has been collected through a lexical availability test to explore the centre of interest “Reading” and a sociodemographic questionnaire with questions related to reading and knowledge of languages. 520 students from the degrees in Early Childhood and Primary Education at the University of Malaga have participated. DispoGen has been used to process the available lexicon and the SPSS package has been used for the statistical analysis. In addition, clusters have been obtained from the lexicon related to digital tools using the DispoGrafo tool. The results show a motivation to read on social networks and a rootedness of the lexicon referred to digital media: *e-book*, *Kindle*, specifying format: *PDF*, *Word*, and type of reading: *digital review*, *Academic Google*, but they do not demonstrate a lexical domain for the formation of new readers.

Keywords: Reading. Virtual environments. Lexical availability. Initial training.

Resumo

Novas formas de leitura surgiram recentemente, e ferramentas e ambientes virtuais foram desenvolvidos para promover a leitura. A formação inicial de professores deve estar atualizada para formar bons mediadores. Portanto, esta pesquisa analisa a presença de ferramentas digitais na concepção de leitura de futuros professores. Os dados foram recolhidos através de um teste de disponibilidade lexical para explorar o centro de interesse “Leitura” e de um questionário sociodemográfico com questões relacionadas com a leitura e o conhecimento de línguas. Participaram 520 alunos dos cursos de Educação Infantil e Primária da Universidade de Málaga. DispoGen foi usado para processar o léxico disponível e o pacote SPSS foi usado para a análise estatística. Além disso, foram obtidos *clusters* do léxico relacionado a ferramentas digitais utilizando a ferramenta DispoGrafo. Os resultados mostram uma motivação para ler nas redes sociais e um enraizamento do léxico referido aos meios digitais: *e-book*, *Kindle*, especificando formato: *PDF*, *Word*, e tipo de leitura: *resenha digital*, *Academic Google*, mas não demonstram um domínio lexical para a formação de novos leitores.

Palavras-chave: Leitura. Ambientes virtuais. Disponibilidade lexical. Formação inicial.

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1 Introduction

The appearance of the technological age and the gradual development of the information society have led to the progressive transformation of ways of life. New needs have been generated to adapt to a changing community. One of the aspects involved in this evolution has been accessed to reading and its socialization (LIU, 2005; CORDÓN GARCÍA; MUÑOZ RICO, 2023).

In this new scenario, social networks have become a widely used element to promote reading. In fact, specific platforms have emerged to read and disseminate what is written (MOKHTARI; REICHARD; GARDNER, 2009).

In accordance with the above, research has focused on how reading processes have changed (DÍAZ DÍAZ; ECHEGOYEN SANZ; MARTÍN EZPELETA, 2022), the tools used to read (ALCOCER

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VAZQUEZ; ZAPATA-GONZÁLEZ, 2021) and in the analysis of the new reading profile (PUTRO; LEE, 2018).

Due to this situation, it is interesting to know the effect that these changes are having on teacher training, since they will be the future mediators (DÍAZ-DÍAZ; ECHEGOYEN; MARTÍN-EZPELETA, 2022). In this sense, taking the members of this group as informants, research has been carried out on their reading habits (JUÁREZ CALVILLO, 2019), their beliefs about reading and its promotion have been explored (DÍEZ MEDIAVILLA; GÜEMES SUÁREZ; MOLINA MOLINA, 2018) and even university training plans around literary education have been reviewed (SOTO-VÁZQUEZ et al., 2022) and inquired about the conceptions that future teachers have about their own training (ÁLVAREZ-ÁLVAREZ; DIEGO-MANTECÓN, 2019).

However, the number of works aimed at exploring the conception that future teachers have about reading is still scarce (CASTILLO FADIĆ; SOLOGUREN INSÚA, 2020). In this sense, studies of the available lexicon can be of great help.

Although lexical availability emerged in France in the 50s of the last Century for educational purposes (GOUGENHEIM et al., 1956), these studies have been advancing and adjusting their methodology with the passing of time (HERRANZ LLÁCER; MARCOS CALVO, 2019). Specifically, in recent years an aspect focused on education has emerged (ZAMBRANO; ROJAS; SALCEDO, 2019) where two important study groups are detected:

- Studies focused on teacher training (CERDA et al., 2017; DE LA MAYA RETAMAR; LÓPEZ PÉREZ, 2020; DE LA MAYA RETAMAR; LÓPEZ-PÉREZ, 2021; HERRANZ LLÁCER, Cristina Victoria, 2018; HERRANZ LLÁCER, Cristina V., 2020; HERRANZ LLÁCER; MARCOS CALVO, 2019; MARCOS; HERRANZ, 2021; MARTÍNEZ-LARA, 2021; QUINTANILLA ESPINOZA; SALCEDO LAGOS, 2019; ROJAS; ZAMBRANO; SALCEDO, 2017; ROJAS DÍAZ; ZAMBRANO MATAMALA; SALCEDO LAGOS, 2019; SANTOS-DÍAZ, 2020; VALENZUELA CASTELLANOS et al., 2018; ZAMBRANO MATAMALA, 2021).
- Studies on the lexicon in a foreign language (DE LA MAYA RETAMAR, 2015; DE LA MAYA RETAMAR; MORA RAMOS, 2019; FERREIRA; GARRIDO MOSCOSO; GUERRA RIVERA, 2019; JIMÉNEZ CATALÁN, 2014; MORA, 2014; SANTOS DÍAZ, 2017; SANTOS DÍAZ; TRIGO IBÁÑEZ; ROMERO OLIVA, 2020).

All these studies have in common the sample: future teachers. We find proposals focused on determining the influence that training exerts to forge the specialized lexicon of teachers (MARCOS; HERRANZ, 2021; SANTOS DÍAZ; JUÁREZ CALVILLO, 2022; VALENZUELA CASTELLANOS et al., 2018; ZAMBRANO MATAMALA, 2021), methodological proposals to form collaborative groups (ROJAS; ZAMBRANO; SALCEDO, 2017) analysis of the relationship between reading and available lexicon (MARTÍNEZ-LARA, 2021; DE LA MAYA RETAMAR; LÓPEZ PÉREZ, 2020).

As far as foreign languages are concerned, the investigations reported pursue the objective of analysing the multilingual lexical competence of a group that must carry out its work in a scenario marked by the development of foreign languages (DE LA MAYA RETAMAR; LÓPEZ-PÉREZ, 2021; SANTOS DÍAZ; TRIGO IBÁÑEZ; ROMERO OLIVA, 2020; SANTOS DÍAZ; JUÁREZ CALVILLO, 2022) or of the recipients of that education system (DE LA MAYA RETAMAR, 2015; DE LA MAYA RETAMAR; MORA RAMOS, 2019; FERREIRA; GARRIDO MOSCOSO; GUERRA RIVERA, 2019; JIMÉNEZ CATALÁN, 2014; MORA, 2014).

This study arises from the collaboration between two research projects. On the one hand, the I+D+i project PID2021-126392OB-100 “Lecturas no ficcionales para la integración de ciudadanas y ciudadanos críticos en el nuevo ecosistema cultural” [Non-fictional readings for the integration of critical citizens in the new cultural ecosystem] that covers the study of reading. On the other hand, the I+D+I project “Observación del Pulso Social en Andalucía a través del análisis léxico (PULSO Andaluz)” [Observation of the Social Pulse in Andalusia through lexical analysis] (Ref. UMA20-FEDERJA-013) focuses on the analysis of the available lexicon. With this, it intends to cover a gap in the current research panorama by approaching the lexicon of future teachers who must carry out an important mediation task to train readers in a changing society. It will be extremely useful to make decisions to improve initial training to know if the new scenarios that are proposed for the training of

readers are truly penetrating their protagonists: future teachers. Above all, it is interesting to know if teachers in training, when thinking about “reading”, evoke elements that suggest the multimodal component (ROWSELL et al., 2018), in their socialization through networks (CORDÓN GARCÍA; MUÑOZ RICO, 2023) or in the formation of new reading profiles (PUTRO; LEE, 2018).

In line with this, the general objective of this research focuses on knowing the concept of reading shared by future teachers of Early Childhood and Primary Education at the University of Malaga from a qualitative approach paying attention to the digital aspect. This concept will be studied in three languages: Spanish, as the mother tongue, and English and French as foreign languages.

Three specific objectives are extracted from this general objective. In the first place, it is intended to analyse the similarities and differences between the most available words in the three languages of the study (O1). Next, it aims to investigate the relationships between words that occur between the book (par excellence on paper) and the e-book in the three languages of the study (O2) and, finally, it seeks to analyse the presence of digital tools and literary practices in the network through the concept of reading in the three languages of the study (O3).

2 Methodology

This research was carried out at the University of Malaga during the 2021-2022 academic year and takes as a reference the methodology of Lexical Availability studies. Thus, using specific programs, it approaches the mental lexicon of future teachers from Malaga. Specifically, in relation to its concept of multimodal reading (ROWSELL et al., 2018). This approach is carried out, firstly, from a quantitative approach and, secondly, from a qualitative perspective.

Along the lines of the study of Santos Díaz and Juárez Calvillo (2022) carried out at the University of Cádiz, this research explores the lexicon available to future teachers in Spanish as their mother tongue and in two foreign languages: English and French. These two foreign languages are selected because the informants have studied them since Secondary Education within the framework of Andalusian multilingual education (JUNTA DE ANDALUCÍA, 2005, 2016). In this way, it is intended to verify if the study of these languages has been significant for the informants. Future teachers will probably work in schools that require a high level of competence in foreign languages (TRIGO IBÁÑEZ; SANTOS DÍAZ; JIMÉNEZ LÓPEZ, 2021).

2.1 Participants

A sample of uniform distribution has been selected (PÉREZ JUSTE, 2009). Thus, 520 ($N = 520$) future teachers from the University of Malaga have participated. 260 are studying the Degree in Early Childhood Education ($n = 260$) and 260 the Degree in Primary Education ($n = 260$). 130 attend the first year and 130 the fourth, which coincides with the end of their training. The average age of the informants is 21.68 years, being 18 the minimum and 43 the maximum. These data make the standard deviation reach a value of 3.501. Figure 1 shows the distribution of the sample according to the degree, year, and sex of the informants.

2.2 Research instruments

Two instruments were used to collect the data for this study. Before applying them, the participants were asked to sign an informed consent. First, a sociological questionnaire was passed with sociodemographic questions: age, sex, mother tongue, etc. Questions related to training were included: year and degree; and knowledge of foreign languages: language level according to the Common European Framework of Reference for Languages (CONSEJO DE EUROPA, 2002), reading in foreign languages, etc. Second, an associative test was applied in Spanish, English and French.

The use of this type of test is classic in studies of available lexicon and is based on the system of open lists with a duration of two minutes. Although the test included five centres of interest, in this work we are going to focus on the repertoires generated from “Reading”. In future research we will pay attention to the lexicon generated in the remaining four: “Teachers”, “Education”, “School: furniture and materials” and “Computers and the Internet”.

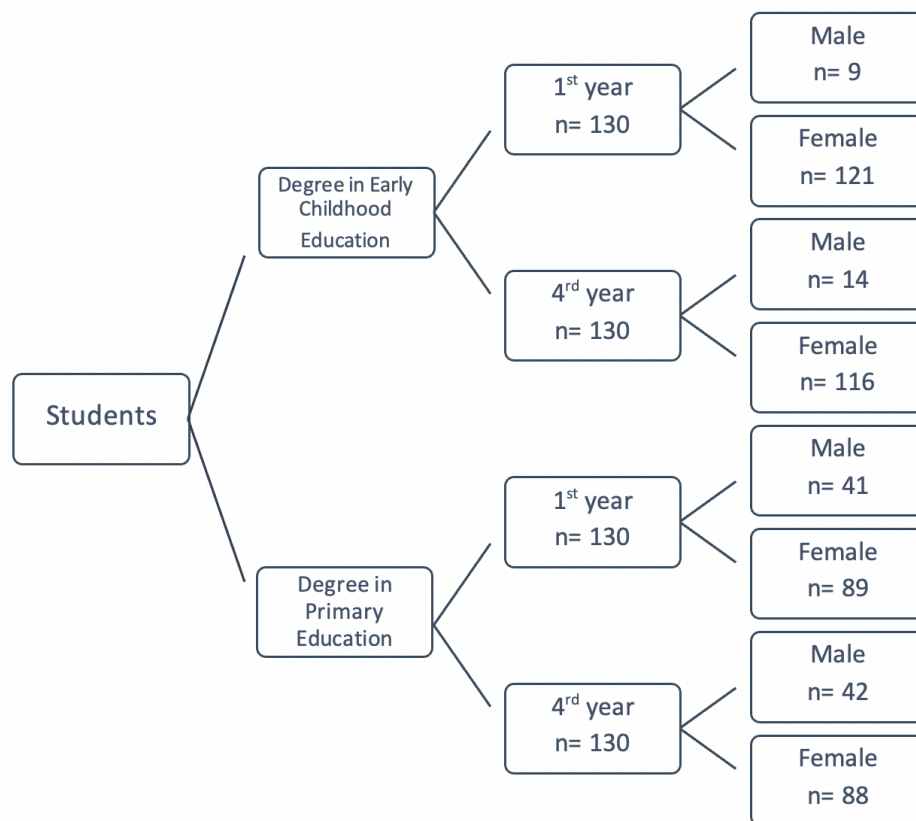


Figure 1. Distribution of the sample.

Source: Own elaboration.

2.3 Procedure

First, the sociological questionnaire was applied. Next, for the available lexicon test, 15 blank sheets of paper were given to the informants where they could write the words associated with each centre of interest in the three languages. In this way, lexical evocation processes were not interfered with (SANTOS DÍAZ; TRIGO IBÁÑEZ; ROMERO OLIVA, 2020; SANTOS DÍAZ; JUÁREZ CALVILLO, 2022). The research team projected the names of the centres of interest on the electronic board. The students copied them and evoked the related lexicon for 2 minutes, following the guidelines of the lexical availability studies (LÓPEZ GONZÁLEZ, 2014). The tests were conducted first in Spanish, then in English, and finally in French. Students were instructed not to pay special attention to spell checking. This eliminated barriers to the detriment of lexical productivity, especially in the foreign language.

Once the questionnaire and the associative test were applied to the informants, an *ad hoc* matrix was created where the different study variables were coded. This allowed a statistical approach to the data using the statistical package IBM SPSS v. 24.

For the edition of the lexical repertoires in Spanish, the guidelines of Samper-Padilla, Bellón, and Samper-Hernández (2003) were followed. For the repertoires in French and English, those established by De la Maya Retamar (2015), Mackey (1971) and Santos Díaz, Trigo Ibáñez, and Romero Oliva (2020) were followed. However, in this work a broad lemmatization criterion has been followed and all the words evoked by the informants in each centre of interest have been admitted. This has made possible to better understand the relationships between words that occur and even explore newly created words.

After the lemmatization phase, the words separated by commas were organized around each informant coded according to the variables in a file (.txt) for each centre of interest and language. From this, the data was processed with the Dispogen II package (ECHEVERRÍA; URZÚA; FIGUEROA, 2005). The use of this package allowed, on the one hand, to obtain the available lexicon by applying

the formula of López-Chávez and Strassburger-Frías (1978) and, on the other hand, to generate associative graphs with DispoGrafo (ECHEVERRIA et al., 2008). In addition, to show a global vision of the most frequent words in each language, word clouds were configured with the Word Cloud Generator application, available on the web: <https://www.nubedepalabras.es/>.

The use of DispoGrafo made possible to analyse and measure the frequency of the set of words that make up the semantic network of a centre of interest (COLLINS; QUILLIAN, 1969; STEYVERS; TENENBAUM, 2005). The name of the program itself provides relevant information about its objectives. “Dispo” refers to the methodology of lexical availability. “Graph” refers to the form acquired by the semantic networks resulting from the frequency calculation of the sequence of words. To generate the graphs Echeverria et al. (2008) are based on the Graph Theory of the mathematical field. Each graph is composed of nodes that correspond to the words. These nodes join each other with edges depending on the relationships established between the words. The frequency of appearance of the same sequence or relationship as “book-library” will be determined by the weight of the edge.

3 Results

3.1 General data according to language

The informants have written a total of 13,380 words in the tests in the three languages. However, as Table 1 shows, the results have been very different depending on the language. Spanish is the language that registers the highest number of total words and presents an average of 14.56 words per informant. This is followed by English, which is usually the first foreign language, with 9.01 words per informant, and finally French, which corresponds in most cases to the second foreign language with 4.33 words per informant.

The cohesion index, calculated by dividing the mean number of words by the number of informants (MENA, 1986), shows that the language with the greatest homogeneity is French, since it is the one that approaches 1. English and, finally, Spanish. This is because the level in French was lower than in the other languages and the lexical repertoire is less rich than in the other two languages (Table 1).

Table 1. Number of words and terms according to language.

	Total Words	Average words	Total Terms	Cohesion index
Spanish	7,569	14.56	1,404	0.010
English	4,612	9.01	737	0.012
French	1,199	4.33	307	0.014

Source: Own elaboration.

From a qualitative perspective, we are going to analyse the production of the first 20 most available words (see Appendix A). The following similarities are observed in the three languages:

- *Libro, book, livre*. In all three languages it is the most available word.
- Leer, read, lire. The action of reading is the second most available word in a foreign language and in Spanish it ranks 10th.
- *Biblioteca, library, bibliothèque*. It is the third most available word in all three languages.
- *Novela, novel, roman*. It is the literary genre present in all three languages.
- *Letra, letter, lettre*. In French and English, they are polysemous words that can mean letter. In Spanish and English, the term *palabra, word* also appears.
- *Aprendizaje, learn, apprendre*. In Spanish the noun is used and in English and French the verb, but the relationship between reading and learning is observed.
- *Cultura, culture, culture*. In all three languages, reading is associated with a cultural activity.

Regarding the similarities of Spanish in only one of the languages, the following words appear with English: 1) *revista, magazine*; 2) *periódico, newspaper*; 3) *historia, history*; 4) *imaginación, imagination*, and 5) *aventura, adventure*. With French the coincidences are minor: 1) *littérature [litterature]*, and 2) *autor, auteur [author]*.

In both foreign languages the following words are repeated: 1) *page* (English), *page* (French).

Table 2. Bivariate correlation between words according to language.

		Words in Spanish	Words in English	Words in French
Words in Spanish	Pearson's correlation	1	0.558**	0.189**
	Sig. (bilateral)		0.000	0.000
	N	520	520	520
Words in English	Pearson's correlation	0.558**	1	0.185**
	Sig. (bilateral)	0.000		0.000
	N	520	520	520
Words in French	Pearson's correlation	0.189**	0.185**	1
	Sig. (bilateral)	0.000	0.000	
	N	520	520	520

** The correlation is significant at the 0.01 level (2 tails).

Source: Own elaboration.

mentioned by 1 informant (0.36%).

Table 3 shows that in the three languages, most informants mentioned *libro* [book], *book*, and *livre* [book]. In English, that percentage rises to 92.77%, followed by French, 78.70%, and Spanish, 78.65%. Nevertheless, when referring to the word *e-book*, the percentage is much lower. In English it is more frequent, perhaps also because in Spanish we would have to add the synonyms used in the mother tongue (*electronic book*, *digital book*). Thus, 10.16% are registered in English, 8.65% in Spanish and only 0.72% in French.

Table 3. Frequency and percentage of appearance of *book* and *e-book* in the three languages.

	Word	Frequency	% Apparition	Word	Frequency	% Apparition
Spanish	Libro	409	78.653	e-book	45	8.654
English	Book	475	92.772	e-book	52	10.156
French	Livre	218	78.700	e-book	2	0.722

Source: Own elaboration.

In addition to the word *book*, there are other words that are usually more specific or simply integrate that root to give rise to other words. Table 4 shows the variants in the three languages. Thus, in Spanish 24 are registered, in English 11 and in French 4. In the three languages reference is made to the digital book and even in Spanish the difference between traditional book and paper book is marked.

Table 4. Words derived from *book*.

Libro	Book	Livre
libro adulto, libro audiovisual, libro de aventura, libro de bolsillo, libro de ilustraciones, libro de imágenes, libro de mano, libro de papel, libro de película Disney, libro de terror, libro de texto, libro didáctico, libro digital , libro electrónico , libro en papel, libro en tablet , libro infantil, libro interactivo, libro interesante, libro olores, libro para niños, libro pedagógico, libro tecnológico, libro tradicional.	bookcase, book for children, bookmark, bookshelf, bookshop, bookTube , book online , booktrailer , digital book , notebook, workbook.	livre de l'élève, livre digital , livre électronique , livre maternelle.

Source: Own elaboration.

Next, the most frequent associations will be shown in the three languages, both from *book* and

e-book. The arrows indicate that the relationship occurs from the moment the informant mentioned the word *book* to the next word. As for the number, it refers to the number of times that association is repeated.

From the term *book*, a subgraph has been generated with the DispoGrafo program (see Figure 3). Edges with a weight equal to or less than 3 have been eliminated, that is, those relationships between words that have only been produced by 3 informants. In addition, the nodes, that is, the sets of words, that had less than 2 connections have been eliminated. In this way, it is observed that there is no allusion to digital tools or new forms of reading on the Internet, since all the words belong to traditional genres (*cuento, novela, poesía, comic*) [story, novel, poetry, comic], they break down the unit of the *libro* (*texto, palabra, letra*) [text, word, letter], refer to the type of reading (*fantasía, aventura*) [fantasy, adventure] and the main agents (*autor, lector*) [author, reader].

With respect to the subgraph created from *e-book* (Figure 5 and Figure 6), those relations with a weight equal to or greater than 2 have been maintained, since the word *e-book* is less available and, therefore, the relations between words are less dense. The relationship is observed both with its synonym, *libro electrónico* [electronic book], and the contrast between *libro* and *papel* [book and paper]. In addition, *tablet* and *periódico* [newspaper] support is included, and references are made to the *grafía* [spelling].

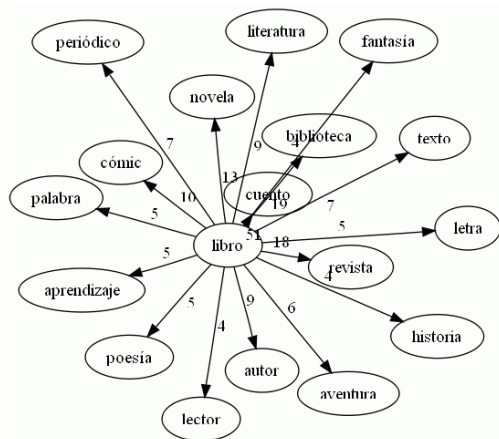


Figure 5. Subgraph from *libro* [book].
Source: Own elaboration.

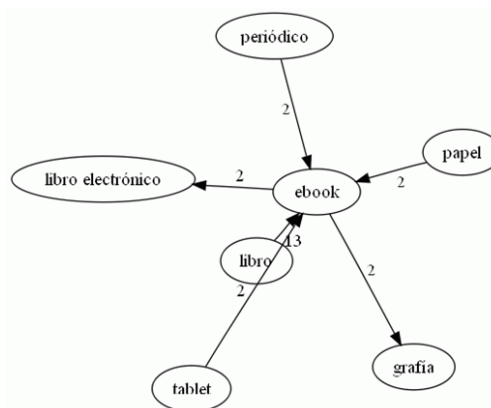


Figure 6. Subgraph from *e-book*.
Source: Own elaboration.

In Table 5, the clusters or groups of words that are repeated in decreasing order have been included. The pair of words that is repeated the most is *libro-cuento* [book-story] (58 informants), followed by *libro-biblioteca* [book-library] (26), *libro-leer* [book-reading] (19) and *libro-revista* [book-newspaper] (19). The binomial *libro-e-book* [book-e-book] appears with 14 appearances and *libro-tablet* [book-tablet] with 8. Among the most common 3-word clusters, there is no allusion to digital tools. As for the clusters generated with *e-book*, it is related above all to virtual tools, such as its synonyms *libro digital, libro electrónico* [digital book, electronic book], as well as other supports such as tablets and analogous referents: *libro, imprenta, papel* and *físico* [book, press, paper and physical].

In the subparagraphs in English, the relationships between words are weaker, so we have only eliminated relationship lower than 3 in Figure 7 and lower than 1 in Figure 8. It is observed how *book* is related to the educational field through *school, teacher* and even *learn* and *vocabulary*. Also included are the verbs *read* and *write* and the nouns *reader* and *writer*. The only relationship with a digital tool is through *e-book*.

Instead, in Figure 8, we see how *e-book* is related to mail and what could perhaps refer to a *tablet*. The informants have written *table*, but this may be due to confusion with *tablet*, since *table* is not such a widely available word in the mother tongue.

Regarding the most frequent clusters (Table 6), *book* is associated with *reading* (46) and with *library* (41), unlike Spanish where the most frequent relationship was with *cuento* [story]. As in Spanish, among the most frequent relationships of words, only *e-book* is found as a digital tool.

Table 5. Clusters in Spanish.

Quantity	Cluster	Quantity	Cluster
58	libro, cuento	14	libro, e-book
26	libro, biblioteca	3	personaje, e-book
19	libro, leer	3	periódico, e-book
19	libro, revista	3	papel, e-book
14	libro, e-book	3	revista, e-book
14	libro, novela	3	escritor, e-book
14	libro, autor	2	libro digital, e-book
13	libro, literatura	2	e-book, libro electrónico
12	libro, cómic	2	e-book, no obligación
12	libro, página	2	e-book, imprenta
10	libro, enciclopedia	2	e-book, grafía
8	libro, lector	2	e-book, físico
8	libro, texto	2	cuento, e-book
8	libro, tablet	2	tablet, e-book

Source: Own elaboration.

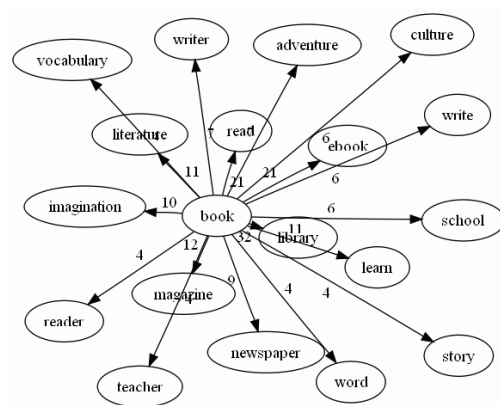


Figure 7. Subgraph from book.

Source: Own elaboration.

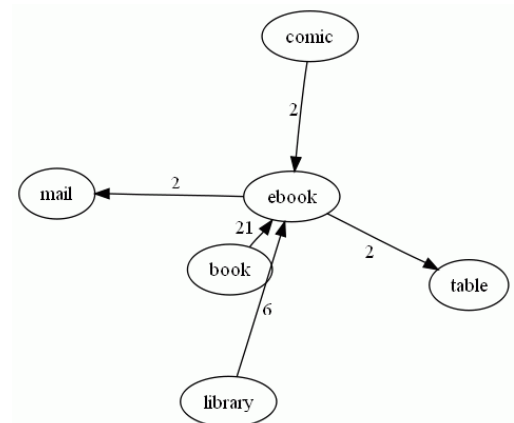


Figure 8. Subgraph from e-book.

Source: Own elaboration.

However, when the relationship between words and *e-book* is analysed, *tablet* and *mail* do appear. As in paper books, *library* also plays an essential role in the electronic format (11 records).

In French relationships between words with a weight equal to or greater than 2 (Figure 9) or 1 (Figure 10) have been shown. There is no reference to digital tools with *livre* [book], perhaps because these words are usually anglicized, and the informants have preferred not to write them. As in English, *livre* [book] is limited to the school environment (*école*) [school] and the family (*famille*). In the case of e-book, it has been related to the traditional format, *livre* [book], and to *lecteur* [reader], the adjective *sympathique* [sympathetic] and, perhaps, to the age at which it is most used, *adulte* [adult].

Because of the low appearance of *e-book*, no cluster has been generated (Table 7). With *livre* [book], the most common binomials are the same as in English (*lire* and *bibliothèque*) [reading and library]. In addition to the word relationships discussed above, *amour* [love] and the repetition of the reading centre of interest stand out.

3.3 New literary tools and practices

Despite the impact of new technologies (ALCOCER VAZQUEZ; ZAPATA-GONZÁLEZ, 2021; DÍAZ DÍAZ; ECHEGOYEN SANZ; MARTÍN EZPELETA, 2022; DÍAZ-DÍAZ; ECHEGOYEN; MARTÍN-EZPELETA, 2022) in Spanish and French there is no word that refers to online literary practices or

Table 6. Clusters in English.

Quantity	Cluster	Quantity	Cluster
46	book, read	10	Book, comic
41	book, library	4	page, e-book
24	book, e-book	2	history, e-book
23	book, letter	2	letter, e-book
19	newspaper, magazine	2	literature, e-book
17	read, write	2	novel, e-book
14	book, page	2	comic, e-book
14	book, learn	2	e-book, Blue Jeans
13	book, literature	2	e-book, table
12	book, newspaper	2	e-book, mail
12	book, magazine	2	newspaper, e-book
11	book, novel	2	tablet, e-book
11	book, imagination	2	paper, e-book
11	library, e-book	2	funny, e-book
10	book, write	2	culture, e-book

Source: Own elaboration.

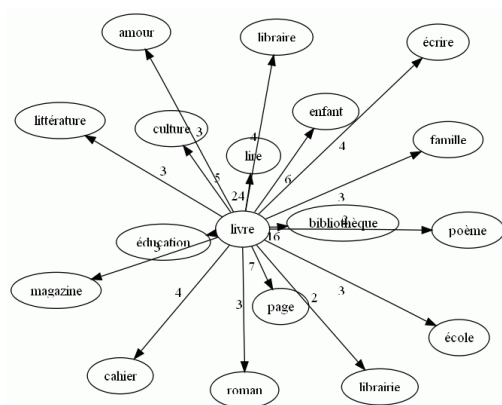


Figure 9. Subgraph from *livre* [book].

Source: Own elaboration.

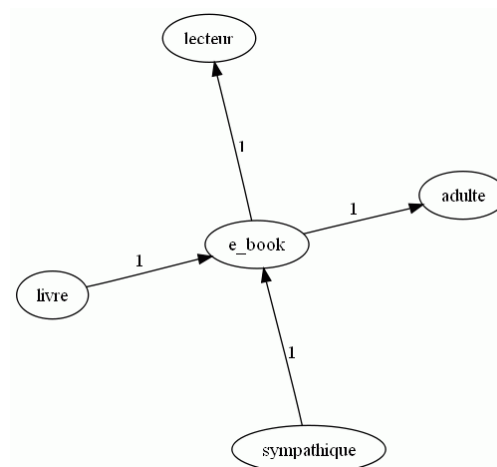


Figure 10. Subgraph from *e-book*.

Source: Own elaboration.

Table 7. Clusters in French.

Quantity	Cluster	Quantity	Cluster
34	livre, lire	7	lire, apprendre
18	livre, bibliothèque	5	livre, amour
9	livre, éducation	5	livre, article
9	livre, enfant	5	livre, cahier
7	livre, littérature	5	livre, famille
7	livre, lecture	5	livre, culture
7	livre, page	5	lire, écrire
7	lire, lectura		

Source: Own elaboration.

tools and virtual environments in promoting reading among the top twenty most available words. In English only appears *e-book*.

Table 8 collects the entries that refer directly or indirectly to new literary practices or digital tools according to language. In addition to the *e-book*, synonyms such as *libro digital* and *libro electrónico* [*digital book* and *electronic book*] appear. In English, self-created words such as *book online* or *technology book* appear. Regarding the type of support, there is *Kindle*, *tablet*, *iPad*, *iPod*, *televisión*, *teléfono*, *ordenador*, and *pantalla* [*Kindle*, *tablet*, *iPad*, *iPod*, *television*, *telephone*, *computer*, and *screen*]. *Internet* and *technology* are mentioned in all three languages. In addition to the common word *correo electrónico* [*electronic mail*], *Gmail* and *Hotmail* appear.

Regarding the format, it has been collected: *digital*, *formato digital* and *soporte digital* [*digital*, *digital format* and *digital support*]. The informants have also mentioned *formato físico*, *distinto formato* o *soporte físico* [*physical format*, *different format*, or *physical support*]. In addition, with digital appears *revista digital*, *periódico digital* and *lectura digital* [*digital review*, *digital newspaper*, and *digital reading*]. In Spanish, three newspapers are mentioned after the entry of *digital newspaper*, which are *ABC*, *Marca*, and *As*.

Along with this, the audiovisual medium is mentioned: *cine*, *documental*, *película*, *película subtitulada*, *serie*, *subtítulo*, and *versión original* [*cinema*, *documentary*, *film*, *subtitled film*, *series*, *subtitle*, and *original version*]. This is coupled with the verb *ver* [*to see*]. Also appear *canción* [*song*] and *videojuego* [*video game*].

Google and *Google Scholar* are registered as search engines. In addition, the *YouTube* platform, and its specific use as a *booktube*. Other formats used are the *web page*, the *blog*, and the *vlog*.

Table 8. Lexicon related to the new literary practices.

Category	Spanish	English	French
	e-book	e-book	e-book
Book types	Libro digital	digital book	livre digital
	Libro electrónico	electronic book	livre électronique
	Kindle	Kindle	
Electronic reading tools	tablet	tablet	tablet
		iPad	
		iPod	
	Correo electrónico	Email	
Platforms and the Internet	Gmail		
		hotmail	
	Página web		
		bookTube	
	Youtube		
	Blog	blog	blog
		vlog	
	redes sociales	Social media	
	Google, Google académico		
	Internet	internet	internet
	marcador		

Formats	digital	digital	
	formato digital		
	Revista digital		
	Periódico digital	digital newspaper	
	Lectura digital		
	PDF		
	Word		
	EPUB		
Audiovisual media	Documental		
	Cine		cinéma
	Cinematográfica		
	Película	film	
	Película subtitulada		
	subtitle		
	serie	soap opera	
	Versión original		
Supports and tools	visualización		
		book trailer	
	soporte	support	
	Soporte digital		
	Soporte físico		
	Móvil	Telephone	
	Televisión	Television	télévision
		IT	
	ver	watch	
	tecnología	technology	
ordenador	computer	ordinateur	
pantalla	screen		
canción	song		
	Videogame		
vídeo		vidéo	

Source: Own elaboration.

4 Discussion and conclusions

The general objective of this research was to discover the concept of reading shared by future teachers of Early Childhood and Primary Education at the University of Malaga in Spanish, French and English. Special attention has been paid to the digital aspect. For this, the methodology of the available lexicon studies has been used (LÓPEZ GONZÁLEZ, 2014). It has been found that this methodology is valid for making an adequate approach to the conceptions of teachers in training to detect opportunities to improve their instruction process.

From a quantitative perspective, the average number of words in Spanish per informant was 14.56. These results are lower than those obtained in previous research such as that of Cristina V. Herranz Llácer (2020) and Santos Díaz, Trigo Ibáñez, and Romero Oliva (2020). However, they coincide with the findings of Santos Díaz and Juárez Calvillo (2022). As for the foreign language, the average number of words per informant in English was 9.01, an issue that exceeds the results of the works by De la Maya Retamar and López Pérez (2020), De la Maya Retamar and López-Pérez (2021) and Santos Díaz and Juárez Calvillo (2022). In French, the average number of words per informant is 4.33, which offers better results than those of Santos Díaz and Juárez Calvillo (2022).

From a qualitative perspective, the first thing that stands out is the fact that, even though the training plans include aspects related to the information society and include elements on multimodal and multimedia reading (SOTO-VÁZQUEZ et al., 2022), it seems that future teachers do not include these elements when referring to reading.

Specific objective 1 has focused on analysing the similarities and differences between the most available words in the three languages of the study. In this sense, it has been found that among the two most available words there are seven that are repeated in the three languages (book, library, novel, learning, letter, reading and culture), which corresponds to 35%. From this it follows that reading is still understood in the traditional sense and, perhaps, it is difficult for future teachers to relate reading to book trailers, booktubers and other ways of promoting reading other than books (ALCOCER VAZQUEZ; ZAPATA-GONZÁLEZ, 2021; GÓMEZ DOMINGO; BÁRCENA TOYOS, 2022). These results coincide with those of the study by Castillo Fadić and Sologuren Insúa (2020), carried out in Chile.

Specific objective 2 aimed to investigate the relationships between words that occur between the book (*par excellence* on paper) and the e-book in the three languages of the study. In accordance with this, it has been found that the relational lexicon is quite homogeneous in both languages and that there are hardly any words that lead us to think about the development of training for mediators within a multimodal society. These results coincide with those of Castillo Fadić and Sologuren Insúa (2020) and those of Juárez Calvillo (2019).

Specific objective 3 sought to analyse the presence of digital tools and literary practices on the Internet through the concept of reading in the three languages of the study. In this regard, it has been found that, despite the frequent use of digital tools by young people (ROWSELL et al., 2018), the words listed are few. These results contradict what was expressed by Cordón García and Muñoz Rico (2023), who reveal a new model of author and reader that takes social networks and fandom as a reference.

In reference to the limitations, we consider the results of this work should be understood as an attempt to understand what happened at the University of Malaga. However, we believe that the study should be extended to other universities. In the first instance, Andalusians and, in the second, from the rest of Spain.

Together with the above, just as De la Maya Retamar and López Pérez (2020) pointed out in the Extremadura context, we consider that the limited lexicon available to our students in relation to multimodal and multimodal reading should be considered as an opportunity to open a reflective space about the training our students receive. As has been verified, it is necessary to make substantial improvements in the programming of degrees in education. This would help to connect the University with social advancement because, at times, it seems that this institution is not as up to date as it should be.

As a prospective line, it would be necessary to undertake a study to identify technicalities such as the one carried out by Santos Díaz, Trigo Ibáñez, and Romero Oliva (2020) to assess whether students can recognize the lexicon referring to new ways of reading (AMIAMA-ESPAILLAT; MAYOR-RUIZ, 2017; CORDÓN GARCÍA; MUÑOZ RICO, 2023; DÍAZ DÍAZ; ECHEGOYEN SANZ; MARTÍN EZPELETA, 2022; DÍAZ-DÍAZ; ECHEGOYEN; MARTÍN-EZPELETA, 2022). In this way it will be possible to know if the informants have the passive knowledge of the vocabulary, but not the active one. Based on these results, more accurate solutions can be traced for the gradual improvement of teacher training, an objective that must be pursued by all nations.

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Author contributions

Ester Trigo Ibáñez: Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review and editing; **Inmaculada Clotilde Santos Díaz:** Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review and editing.

A Appendix

20 More available words per language.

	Term	Lexical availability index	Frequency	% Apparition	Accumulated frequency
More available words in Spanish					
1	Libro	0.709 81	409	78.654	0.054
2	Cuento	0.228 54	168	32.308	0.076
3	Biblioteca	0.139 13	111	21.346	0.091
4	Poesía	0.128 28	113	21.731	0.106
5	Novela	0.126 95	105	20.192	0.120
6	Aprendizaje	0.124 48	101	19.423	0.133
7	Letra	0.113 19	95	18.269	0.146
8	Literatura	0.104 21	79	15.192	0.156
9	Imaginación	0.100 69	84	16.154	0.167
10	Leer	0.098 63	73	14.038	0.177
11	Cultura	0.098 11	82	15.769	0.188
12	Revista	0.097 70	82	15.769	0.198
13	Diversión	0.087 93	69	13.269	0.208
14	Historia	0.087 05	84	16.154	0.219
15	Autor	0.085 14	75	14.423	0.229
16	Periódico	0.082 00	68	13.077	0.238
17	Conocimiento	0.076 57	73	14.038	0.247
18	Lector	0.070 02	54	10.385	0.254
19	Palabra	0.069 62	63	12.115	0.263
20	Aventura	0.068 16	57	10.962	0.270
More available words in English					
	Term	Lexical availability index	Frequency	% Apparition	Accumulated frequency
1	Book	0.872 28	475	92.773	0.103
2	Read	0.190 09	122	23.828	0.129
3	Library	0.160 02	115	22.461	0.154
4	Letter	0.123 80	89	17.383	0.174
5	Learn	0.102 34	74	14.453	0.190
6	Word	0.092 32	68	13.281	0.204
7	Newspaper	0.091 26	70	13.672	0.220
8	Culture	0.077 01	59	11.523	0.232
9	E-book	0.072 55	52	10.156	0.244
10	Writer	0.069 42	53	10.352	0.255

11	Imagination	0.067 88	51	9.961	0.266
12	Page	0.067 37	51	9.961	0.277
13	Love	0.065 31	50	9.766	0.288
14	Write	0.064 67	50	9.766	0.299
15	Novel	0.064 26	47	9.180	0.309
16	Education	0.063 53	50	9.766	0.320
17	Adventure	0.062 76	50	9.766	0.331
18	Magazine	0.059 57	49	9.570	0.342
19	Paper	0.059 05	46	8.984	0.351
20	History	0.057 85	48	9.375	0.362

More available words in French

	Term	Lexical availability index	Frequency	% Apparition	Acumulated frequency
1	Livre	0.750 86	218	78.700	0.182
2	Lire	0.212 16	68	24.549	0.239
3	Bibliothèque	0.109 36	40	14.440	0.272
4	Éducation	0.074 62	29	10.469	0.296
5	Professeur	0.071 84	28	10.108	0.319
6	Enfant	0.071 47	25	9.025	0.340
7	Écrire	0.065 37	24	8.664	0.360
8	École	0.064 22	24	8.664	0.380
9	Lecture	0.063 00	21	7.581	0.398
10	Roman	0.061 87	27	9.747	0.420
11	Amour	0.058 39	25	9.025	0.441
12	Famille	0.052 33	21	7.581	0.459
13	Littérature	0.048 05	19	6.859	0.475
14	Culture	0.044 72	16	5.776	0.488
15	Page	0.037 54	14	5.054	0.500
16	Cahier	0.036 35	11	3.971	0.509
17	Apprendre	0.028 93	13	4.693	0.520
18	Lettre	0.025 44	9	3.249	0.527
19	Auteur	0.025 21	9	3.249	0.535
20	Compréhension	0.023 64	8	2.888	0.541

Source: Own elaboration.