Reading comprehension and academic performance, an analysis in primary basic education students from Yopal – Casanare

Comprensión lectora y rendimiento académico, un análisis en estudiantes de educación básica primaria de Yopal – Casanare

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SUMMARY

Reading comprehension is a process through which the student shows his ability to analyze, interpret and argue about a topic that he has read and allows him to respond in fields of knowledge and solve problems. This study aimed to relate the evaluation of reading comprehension with the academic performance of primary school students from Yopal Casanare. A quantitative study was carried out, with a nonexperimental design, of correlational scope and moment of a cross-sectional study. We worked with 190 fifth-grade students to whom the PROLEC - R test was applied, and the academic performance was obtained from the results of the Competent Reader entrance test. For the data analysis, the statistical package SPSS V24 was used, which allowed the establishment of the use of frequencies, percentages, and measures of central

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tendency and variabilities such as the mean, standard deviation, skewness, and kurtosis. Following this, cross tables were used to achieve detailed descriptions of frequency in contrast to other variables and with it the chi-square test. Finally, the Pearson correlation statistic was applied to establish associations between variables. The results show a significant correlation between reading comprehension and satisfactory academic performance in the studied sample. It is concluded that students who have reading habits present better academic performance.

Keywords: Reading comprehension, academic performance, competent reader, correlation, scores.

RESUMEN

La comprensión lectora es un proceso mediante el cual el estudiante muestra su habilidad para analizar, interpretar y argumentar sobre un tema que ha leído y le permita responder en campos de conocimiento y resolver problemas. El objetivo consistió en

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relacionar la evaluación de la compresión lectora con el rendimiento académico de estudiantes de básica primaria de Yopal Casanare. Se llevó a cabo un estudio cuantitativo, con diseño no experimental, de alcance correlacional y momento de estudio transversal. Se trabajó con 190 estudiantes del quinto grado a los que se les aplicó la prueba PROLEC – R y el rendimiento académico se obtuvo de los resultados de la prueba de entrada Lector Competente. Para el análisis de datos se utilizó el paquete estadístico SPSS V24, que permitió establecer uso de frecuencias, porcentajes y medidas de tendencia central y variabilidad como la media, desviación estándar, asimetría y curtosis. Seguido a esto se procedió al uso de tablas cruzadas para lograr descripciones detalladas de frecuencia en contraste con otras variables y con ello la prueba de chi cuadrado. Finalmente, se aplicó el estadístico de correlación de Pearson para establecer asociaciones entre variables. Los resultados muestran una correlación significativa entre la comprensión lectora y el rendimiento académico satisfactorio en la muestra estudiada. Se concluye que los estudiantes que tienen hábitos de lectura presentan un mejor desempeño académico.

Palabras clave: Compresión lectora, rendimiento académico, lector competente, correlación, puntuaciones.

INTRODUCTION

In the international context, the specific case related to the reading process and the existing relationships with academic performance are described through test results and international reports on education and issues that affect it, according to the United Nations Organization (1), the results show minimum levels of reading comprehension. In Latin America, it is contrasted with educational policies, culture, technology, economy, ecology, and the contextualization of education according to each country or region that presents a low academic performance in standardized tests. Knowing the significant aspects of the academic performance of students from the reality of the classroom shows the problem in a general way and through a review of research related to reading, reading comprehension, and academic performance, this problem is contextualized (2).

There is research that relates reading comprehension and academic performance as necessary variables for analysis from different contexts. Reading is not only the reproduction or repetition of written communication. Reading is a communication process between the writer of the text and the reader of the text. Reading makes it possible to discover different ways of learning. The writer encodes the message to be transmitted to the reader and the latter decodes when reading it. Therefore, factors intervene in the brain from the cognitive aspects of the one who writes and the one who reads. Through graphic signs, the writer makes his message known, in addition to printing a communicative intention, these intentions develop when the linguistic ability to read is developed (3-7).

Reading comprehension affects academic performance, indicating that the student at school has the support of the teacher to clarify doubts and deepen their reading comprehension, while at home they may suffer from low reading comprehension by not finding the precise guidelines (8). The investigation was carried out to determine how reading comprehension influences the school performance of seventh-grade students, for which we proceeded to verify the problem raised through the operationalization of variables, using as a research source an article on academic performance that supports the purposes and representations of academic performance (9,10).

The problems of reading comprehension and academic performance occur at different ages and times of study. In Peru there is an investigation in which an analysis of the problem of reading for comprehension was developed, that is, to read thinking as the author indicates. The results indicate the lack of mastery of the dimensions of scrutiny appreciation that favors understanding and constructing new meanings, classifying, analyzing and inferring cognitive processes and capacities that are consistent with reading comprehension. The research with a quantitative methodology used a system for the exploration perception variable. A survey was carried out on 95 students of the cycle I and for the academic execution narrative research was used as a procedure. An exam was carried out that statistically deciphered how there was a connection between reading comprehension and academic performance (11).

In Peru, they also developed a quantitative, descriptive study in which they found that only 26 % of the students acquired the importance of strategies such as drawings, graphs, mental images, or questions for the comprehension of a text. Regarding a confrontation on strategies used by the teacher, it was possible to identify that only 20 % of the teachers provide orientation to the students on the importance of the use of learning strategies, such as drawings, graphs, and questions that strengthen reading comprehension and that they allowed students to retrieve information through the reading exercise (12).

In Guatemala delved into reading comprehension as a competence, part of a communication process between the reader and the text. This means that the reader achieves an internal communication process: he wonders, analyzes, criticizes, reflects, and achieves confidence in his school expectations. Within the experimental proposal, the researcher proposed strategies to improve reading comprehension and plan activities. For example, the use of comparisons, where he proposed as an action to ask the questions to easily find the similarities, differences, and how they were related to each other to predict the reading comprehension abilities of the students according to reading ability and internal communication process (13).

It is necessary to know the difficulties that students present with regard to their reading comprehension at school to relate aspects of their academic performance, and attention processes to the development of instructional activities and understand the concepts derived from the study on reading, reading comprehension, and of the strategies that are implemented through different investigations, the analysis of the data is an example. In addition, the attention to the contextualization of the institutional problem is of great importance because the social, cultural function is also favoured, not only as a need for to study the problems in the school environment that affect student learning, it is also necessary to intervene in the factors associated with a deficient reading comprehension ability (14-16).

The problem of reading comprehension associated with academic performance is also present in the city of Yopal and in the Educational Institution where the study was developed:

Colegio Luis Hernández Vargas, an institution in which it was required to apply a test that would allow finding aspects of identification specific to reading comprehension and finding the existing correlations between reading comprehension and academic performance through an external test. In the research process, the results of the entrance test were used, carried out by the Merani Foundation, and the application of instruments to evaluate the levels of reading comprehension PROLEC - R.

METHOD

In the present study, a non-experimental design was used, with a quantitative approach, correlational type, and cross-section, the population refers to the total number of students enrolled in the Luis Hernández Vargas school in fifth grade, which corresponds to 280 students, the sample consisted of 190 fifth grade students (Table 1).

Table 1. Sample

| Campus | Students | Sample |
|-----------------------|----------|--------|
| Camilo Torres | | |
| Headquarters | 14 | 7 |
| Headquarters | 100 | 55 |
| Headquarters Salvador | | |
| Camacho Roldán | 65 | 50 |
| Headquarters Marco | | |
| Fidel Suárez | 101 | 78 |
| | | |

Source: self-made

Collection instrument

For the collection of data corresponding to reading comprehension, the revised version of the PROLEC-R test was used with its battery of evaluation of reading processes - revised. The corresponding questions were asked in the processes to the identification of letters, lexical processes, grammatical processes, and semantic processes (17).

The psychometric instrument of the Revised Reading Process Assessment Battery (PROC-LEC-R) is an instrument that was adapted from a Peruvian Center for Hearing, Language, and Learning, in Lima, Peru, where it was applied to 504 students belonging to 14 Educational Institutions, obtaining as a result that the PROLEC-R scores are reliable, calculated through the internal consistency method (Cronbach's alpha). Likewise, it evidences the validity of the content (expert judgment), criterion (concurrent validity), and construct (confirmatory factor analysis) (17).

Instrument reliability

The PROLEC – R instrument presents consistent results, which facilitates the functions of the instrument and allows taking results according to the battery of questions applied and the results are consistent. Reliability is established with internal consistency and reporting functions. Overall Cronbach's alpha: 0.7. Process information functions in letter identification, syntactic and semantic processes (17).

Procedure

The project was socialized to managers, teachers, parents, and students of the Luis Hernández Vargas school in a virtual way using the Zoom Platform, once the institutional permission was obtained, the parent signed the informed consent and the assent by the fifthgrade students through a Google form and the application schedule was organized.

On the scheduled day, the PROLEC-R Reading Process Assessment Battery was applied, through the online questionnaire, ensuring the information with the respective responses of each student. And recording the corresponding scores using a stopwatch used by the researcher to take the times and take them to the speed indices on the answer sheet. The information was completed by performing each of the nine tasks. The open questions were answered by the student individually and recorded in the online form.

The procedure for collecting information virtually was developed over four months with 90 students who were scheduled online. The test took a maximum of 30 minutes, but time was given for questions related to informed consent and assent, sociodemographic aspects, and academic background. The process continued in person under resolution 777 of June 2, 2021, for the return to face-to-face, the groups began alternately, which facilitated the scheduling process. Having the corresponding permits for face-to-face classes, the process continued to be carried out in person, for which, in the same way as with the virtual group, we proceeded with the telephone call to contextualize the parents and guardians and obtain the corresponding permissions to send the informed consent via WhatsApp, which is the communication mechanism used by parents and guardians.

It was a requisite to receive first the signed consent and then proceed to schedule according to the class schedule, group, and location. Then the communication was generated with the grade director for the visit to the corresponding headquarters and corresponding grade. Then it was applied the instrument to the students who had informed consent. In this exercise, the directives: rector, coordinators, and students were attentive to collaborate and participate according to the indications and it was possible to complete the face-to-face process with one hundred students, the application of the instrument and the sociodemographic information was carried out, academic records were recorded with a telephone call. The physical test was carried out in a suitable place for the process where only the student and the researcher were to guide the process of applying the instrument, take the corresponding measurements and the student answered the questions that required open answers, developed it on the sheet of instrument responses.

The process was developed for approximately two months in person. The time allocated for data collection took a total of seven months, as it is a highly complex questionnaire with an evaluation of nine tasks for reading processes. Data was obtained from a total of 190 participants for seven

months, five virtual months, and two face-toface. After obtaining the data, the information was organized in an Excel table with nominal values to continue the process of data analysis.

Data Analysis

The analysis of results was carried out initially using a data matrix in Excel that was later transferred to SPSS V24. Subsequently, the descriptive analysis was carried out using frequencies, percentages, and measures of central tendency and variability such as the mean, standard deviation, skewness, and kurtosis. Cross tables were used to achieve detailed descriptions of frequency in contrast to other variables and with it the Chi-Square test. Pearson correlation statistic was applied to determine the level and direction of the associations between the variables.

Ethical considerations

The certification process for working with humans in the development of research was carried out, with the signing of the consent and the informed assent. It was a communication process between professionals and participants, where the parents' indicated approval of the informed consent for the participation of their sons and daughters because they were minors and in the same way the students generated the assent of wanting to participate voluntarily without any compensation, by the process and carrying out the respective intervention, the choice to participate is allowed and no type of discrimination is generated (18).

RESULTS

The study participants were between the ages of 9 and 10 with M=9.28 and DE=0.45, an issue that denotes homogeneity with respect to this variable. Regarding the gender variable, a very similar representation of both men and women was found, with 51.1 % being women and 48.9 % being women.

In relation to the academic characteristics of the students, the most relevant aspects were identified through survey-type questions in which it was identified that 91.1 % have not failed school years, in contrast to the 8.9 % who reported having failed a year. They inquired about the existence or not of a reading routine that included even the vacation period, to which only 12.1 % answered yes and 56.8 % said yes sometimes. Regarding the development of processes related to competent readers, most of them (84.2 %) stated that they had been part of these. Finally, regarding the use of language material, the data shows that 51.6 % answered affirmatively (Table 2).

Table 2. Academic characteristics of the participants

| | | Frequency | Percentage |
|----------------------------------|----------|-----------|------------|
| Has failed a year | Yes | 17 | 8.9 |
| • | No | 173 | 91.1 |
| | Total | 190 | 100.0 |
| Reading routine | | | |
| including holidays | No | 59 | 31.1 |
| • | Sometime | s 108 | 56.8 |
| | Yes | 23 | 12.1 |
| | Total | 190 | 100.0 |
| Development of processes related | | | |
| to competent readers | Yes | 160 | 84.2 |
| | No | 30 | 15.8 |
| | Total | 190 | 100.0 |
| Use of language | | | |
| material | Yes | 98 | 51.6 |
| | No | 92 | 48.4 |
| | Total | 190 | 100.0 |

Source: self-made.

The performance levels regarding the reading routine in the participants were analyzed, from which it was identified that all the participants who were located in advanced levels in reading performance, reported having a reading routine including the vacation season. Meanwhile, the participants who reported not having a reading routine were located at a satisfactory level of reading performance. And the participants who reported a reading routine sometimes obtained mostly satisfactory and minimum levels of performance (Table 3).

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Table 3. Crosstab reading routine* Performance level

| | | Performance level | | | Total |
|------------------------------------|-----------|-------------------|------------|----------|-------|
| | | Minimum | Satisfying | Advanced | |
| Reading routine including holidays | No | 9 | 50 | 0 | 59 |
| | Sometimes | 43 | 65 | 0 | 108 |
| | Yes | 5 | 6 | 12 | 23 |
| Total | | 57 | 121 | 12 | 190 |

Source: self-made.

The Chi-Square test for the reading routine and the reading performance test showed that there is perfect agreement between the expected

frequencies and the observed frequencies (Table 4).

Table 4. Chi-Square test Reading routine/Competent reader test

| | Worth | df | Asymptotic (bilateral) Significance |
|-------------|---------|----|---|
| Pearson | | | |
| Chi-Square | 104.820 | 4 | 0.0001 |
| Likelihood | | | |
| ratio | 70.139 | 4 | 0.0001 |
| Linear-by- | | | |
| linear | | | |
| association | 2.407 | 1 | 0.121 |

Source: self-made.

The frequency of responses of the participants was analyzed relating the level of reading performance with the use of language matter, from which it was evidenced that the data were

not conclusive because the distribution was quite similar, however, it was identified that the children who were located at a satisfactory level mostly reported use of the language material (Table 5).

Table 5. Crosstab Material Use*Performance Level

| | | Pe | Performance level | | |
|--------------------------|-----|---------|-------------------|----------|----|
| | | Minimum | Satisfying | Advanced | |
| Use of material language | | | | | |
| | Yes | 26 | 66 | 6 | 98 |
| | No | 31 | 55 | 6 | 92 |

Source: self-made.

The Chi-Square test for the use of language material and the reading performance test showed that there is perfect agreement between the expected frequencies and the observed frequencies (Table 6).

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Table 6. Chi-Square test using material/Competent reader test.

| Worth | df | Asymptotic (bilateral) | Significance | |
|------------------------------|--------|------------------------|--------------|--|
| Pearson Chi-Square | 1.250a | 2 | 0.535 | |
| Likelihood ratio | 1.251 | 2 | 0.535 | |
| Linear-by-linear association | 0.704 | 1 | 0,402 | |

Source: self-made.

To establish the relationships between reading performance and the factors corresponding to students' reading comprehension, their scores were initially analyzed with the sociodemographic and academic characteristics evaluated, from which significant negative relationships were identified, although low with age (r=-0.188**

r=-0.194**), likewise, low correlations with socioeconomic status (r=0.226** r=-0.263**). On the other hand, high positive significant correlations were identified between the years studied at the institution and the results of the proficient reader test and the level of performance (Table 7).

Table 7. Correlations between participant characteristics and reading performance.

| | | Age | Socioeconomic | Years studied at the institution |
|------------------------|---|-------------------|-------------------|----------------------------------|
| Proficient Reader test | Pearson correlation | -0.188** | 0.226** | 0.654** |
| | Sig. (bilateral) | 0.009 | 0.002 | 0.0001 |
| Performance level | Pearson correlation Sig. (bilateral) | -0.194** 0.007 | 0.263** 0.0001 | 0.633** 0.0001 |

Grades: *. The correlation is significant at the 0.05 level (bilateral).

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

Source: self-made.

After the previous analysis, the existing relationships between the reading comprehension evaluated through the PROLEC - R and the academic performance evaluated through the external evaluation test of competent reader were established, identifying highly significant correlations between the total score and the level of performance and the letter identification, lexical processes and punctuation marks located between 0.737** and 0.915** (p=0.0001). Although significant statistical correlations were also identified between reading comprehension and semantic processes, which were located between 0.298** and 0.360** (p=0.0001) (Table 8).

To complement the correlation analysis between the variables, the relationships between the precision indices were analyzed before which significant values were located between reading performance and word identification that ranged between 0.514** and 0.973** (Table 9).

Correlations between reading performance or performance and reading comprehension speed indices were also analyzed, identifying high negative significant correlations between word identification, and punctuation marks whose associations varied between -0.705** and -0.941** (p= 0.0001) (Table 10).

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Table 8. Correlations between main PROLEC-R indices and reading performance

| | | Ip letter name | Same- different ip | Ip word reading | U | Ip rammatical structures | Ip punctuation marks | Ip n sentence compre- hension | | Ip listening compre- hension |
|------------------------------------|-----------------------------------|-----------------------------|--------------------------|-----------------------|-----------------------------|--------------------------------|-----------------------------|--|-----------------------------|---------------------------------------|
| Proficient reader test Performance | Pearson Sig. (bil.) Pearson | 0.889** 0.000 0.915** | 0.000 | 0.000 | 0.954** 0.000 0.808** | 0.000 | 0.961** 0.000 0.891** | 0.333** 0.000 0.355** | 0.320** 0.000 0.360** | 0.298** 0.000 0.320** |
| level | Sig. (bil. | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Grades: *. The correlation is significant at the 0.05 level (bilateral).

Source: self-made.

Table 9. Correlations between PROLEC-R accuracy indices and reading performance

| | | IPR Name of Letters | IPR same- different | IPR word reading | IPR pseudoword reading | IPR punctuation marks |
|------------------------|---------------------|------------------------|------------------------|---------------------|------------------------------|-----------------------------|
| Proficient reader test | Pearson correlation | 0.584** | 0.751** | 0.944** | 0.973** | 0.948** |
| | Sig. (bilateral) | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Performance level | Pearson correlation | 0.514** | 0.632** | 0.799** | 0.841** | 0.834** |
| | Sig. (bilateral) | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

^{*.} The correlation is significant at the 0.05 level (bilateral).

Source: own elaboration.

Table 10. Correlations between PROLEC-R speed indices and reading performance

| | | IV name of letters | Same- different IV | IV reading of words | IV pseudoword reading | IV punctuation marks |
|-------------|-----------------------------|--------------------|--------------------------|---------------------------|-----------------------------|----------------------------|
| Proficient | Pearson | | | | | |
| reader test | correlation | -0.865** | -0.941** | -0.870** | -0.968** | -0.897** |
| Performance | Sig. (bilateral) Pearson | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| level | correlation | -0.859** | -0.841** | -0.705** | -0.836** | -0.892** |
| | Sig. (bilateral) | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Grades: *. The correlation is significant at the 0.05 level (bilateral).

Source: self-made.

^{**.} The correlation is significant at the 0.01 level (bilateral). IP=Main Index

^{**.} The correlation is significant at the 0.01 level (bilateral). IV= Precision Index

^{**}The correlation is significant at the 0.01 level (bilateral). IV= Speed index

In conclusion, it should be noted that from the results found, significant correlations were identified between reading comprehension and academic performance, supporting the working hypothesis.

DISCUSSION

Evidence indicate a strong relationship between reading comprehension and academic performance, for example, some findings (3) describe the importance of reading comprehension from grammatical, semantic, syntactic, the necessary correspondences between sounds, codes, and production, without forgetting the reader's position in front of the text so that it generates an understanding and can perform academically.

In the same way, in Peru it was schematized the reader's position among the three aspects: the reader, text, and context, then demonstrate in their theory that the relationship between the efficient reader and the results obtained academically is part of their reading skills (11,12,19). The theoretical assumptions delve into the two variables generates a consensus in understanding reading comprehension as a cognitive process developed between the reader, the text, and the context explicitly and implicitly to build ideas about their meanings and generate understanding (20).

Several authors have examined the effects of reading comprehension and academic performance (3,11,20). By identifying the contributions related to the ability to read and comprehend, analysis skills, inferences, and comparing the results of this research that proposed finding the relationships between reading comprehension and performance, it can be contrasted with other research that has made it possible to show that reading comprehension problems and academic performance are presented at different ages and times of development. This research is related to analyzing the same variables reading comprehension and academic performance, the research is focused from the abilities to understand and construct new meanings, classify, analyze and infer cognitive processes and abilities that make reading comprehension possible, a student can continue presenting the same problems of lack of understanding and impact on academic performance, if strategies are not intervened (11).

The literature review, the empirical studies and the theoretical foundations that support the two study variables, some of the research in these fields of knowledge of these two variables is evident. The contributions of other investigations conclude that reading comprehension affects academic performance (8), some delve into reading comprehension from inference processes and strategies to strengthen reading comprehension (21).

Regarding the Chi-Square test for the reading routine and the reading performance test, it was evidenced that there is perfect agreement between the expected frequencies and the observed frequencies, studies related to the evaluation of reading comprehension from the formulation of self-questions are evident, where the student's ability to self-regulate and activate their prior knowledge stands out in this research. The contribution of this research is highlighted in a comparative point in those students who have routines, habits, and strategies that can be used for the benefit of their reading comprehension and academic performance, in addition, they establish processes from the first grade of primary school (22).

CONCLUSIONS

The research carried out contributes to society and to the field of knowledge studied in relation to the processes developed in reading comprehension and academic performance, which must be applied to evaluation instruments that allow identifying in a contextualized way aspects that are important at the end of primary school. They are considered to be out of date but they are unresolved issues, specifically related to phonetic reading, primary decoding (reference, synonymy, lexical retrieval, contextualization, concepts), secondary, tertiary, categorical, and meta-semantic decoding. From the contributions of this research, any way to enhance the reading skills of students is a way to improve, develop and enhance intelligence and thinking.

The study generated evidence on what is related to the variables of reading comprehension and academic performance and identifies factors contextualized to a public school on the evidence through data, analysis, and results that poor student reading favors children's failure and girls who are intelligent, creative, and talented but whose reading level does not allow them to reach their full potential and, most seriously, continue to advance in their school years with unresolved reading difficulties, making the processes difficult in the following school years and making it difficult to present excellent performance in the development of their abilities, skills, and knowledge.

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