

THE IMPACT OF CONCEPT-ORIENTED READING INSTRUCTION (CORI) ON STUDENT ACHIEVEMENT AND READING COMPREHENSION SKILLS IN ELEMENTARY SCIENCE TEACHING

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ABSTRACT: *The purpose of this study is to see how Concept-Oriented Reading Instruction affects students' science academic performance and reading comprehension. The study included 72 students from two sections of Father William F. Masterson, SJ Elementary School's Grade IV level. A total of 36 learners makes up the control group, while another 36 make up the experimental group. Lessons were delivered via the internet to the experimental group, while the control group received lessons via modular instruction using the Department of Education's modules.*

The initial reading comprehension level of learners based on the PHIL-IRI shows that only 29% of students fit as Independent reader, there are 40.3% of students belongs to Instructional reading level, and there are 30.6% of students fits the Frustration level of reading and comprehension skill. These results fall short of the expectation for Grade IV students, who should be reading and comprehending independently.

The implementation of CORI resulted in an increase in learners' reading comprehension. Students exposed to CORI have a significantly higher mean reading comprehension score than students exposed to the conventional method. The CORI has resulted to fewer learners in the Frustration level at 8.3 %. The greater percentage of learners exposed to CORI were in the Independent level at 30.6 % and the highest were in the Instructional level at 61.1%. When it comes to student achievement in science, the use of CORI is just as effective as the traditional teaching approach.

Keywords: Concept-Oriented Reading Instruction (CORI), Phil-IRI, Achievement, Reading comprehension

INTRODUCTION

Reading is the ability to understand words contained in a document and make use of the knowledge for personal growth and development [1]. This implies making meaning out of recorded information either printed or non-printed in the life of an individual. People read for different reasons and purposes, some of which include for pleasure, leisure, relaxation, information and for knowledge.

Reading is the identification of the symbols and the association of appropriate meaning with them. It requires identification and comprehension. Comprehension skills help the student to understand the meaning of words in isolation and in context [2].

Reading is an essential tool for knowledge transfer and the habit of reading is an academic activity that increases skills in reading strategies. To know about the world and its environment, a child helps himself through reading books, newspapers and other magazines. Once the child has been taught to read and has developed the love for books, he can explore for himself the wealth of human experiences and knowledge through reading. Children who miss the opportunity of getting in touch with books in their early stages of life find it hard to acquire good reading habits in their later years [3]. Reading is an intellectual action which is possible only if a man forms a habit of reading and practices these from childhood.

The problem most students in Grade 4 is their ability to read and to become an independent level reader. For an excellent performance, there is the need for the student to form good reading and study habits. At present, due to the influence of the mass media, people do not show much interest in reading books; magazines and journals, among others [4]. Many students prefer to watch movies and other shows on the television, listening to audio-CDs, watching video-CDs, among others [5].

One of the many issues confronting students nowadays is, perhaps, not their inability to read but their lack of interest.

Many students have difficulty in science because they are passive readers, readers who receive information without understanding. Passive readers begin reading assignments without thinking about the subject. Their counterparts, known as active readers, interact with text to construct meaning. They make predictions, ask questions, generate questions, and vigorously seek answers. For active readers, reading is a means of actively pursuing knowledge. Active readers engage in metacognition, which is an awareness of how they think. Active readers use both pre-reading and during-reading strategies to enhance their comprehension. Science students need to be as aggressive reading their textbooks. They cannot merely wait for the information to diffuse over to them, because it won't happen that way. In a figurative sense, they need to attack the text. They need to ask questions and actively pursue the answers. They need to ask "Why? How? What if? Why not?" They must pursue answers to their questions and, in turn, not be satisfied with the answers. Answers to questions should lead to more questions.

Further, the students must know how to contextualize. Contextualization is quite similar in reading history and science. A text consisting of "the cell could not be observed because it was too dark" has different meanings depending on whether it is a leaf cell or a prison cell. The type of leaf or the location of the prison also influences interpretation. These contextual effects are profoundly important to understanding a large majority of informational texts in science [6]. Consequently, it is believed that teaching these processes to graders will be useful across subject matter areas. Such broad contextualization processes that are general to science can be measured and are correlated with diverse reading required in high school and standardized tests in prior CORI studies [7],[8]. Consequently, it is the generalizable text structuring and contextualization processes widely needed in history and science reading that we incorporated into CORI.

Additionally, the researcher observed that the students need to improve their understanding in the text they read. The result of the Phil- IRI has shown that students in Grade IV level in West 1 District during the Phil-iri Pretest have 29% frustration readers, 41% instructional readers, 29% independent readers. However, during the Phil-iri Posttest result the learners have 12% under frustration readers, 39% instructional readers, and 49% independent readers. Though the number of the independent readers increased the District aims to have higher percent of independent readers in the Division. This is to build a foundation of the student's reading ability in preparation for the secondary level of their education. For the first time, Philippines joined the Programme for International Student Assessment (PISA) of the Organization for Economic Cooperation and Development (OECD) in 2018, as part of globalizing the quality of Philippine basic education reform plan. The PISA results released on Dec. 3, 2018 revealed that the Philippines scored 353 in Mathematics, 357 in Science, and 340 in Reading, all below the average of participating OECD countries [9]. The study aims to determine the effect of Concept-Oriented Reading Instruction to the students' science academic performance and reading comprehension skills.

METHODOLOGY

The study employed a quasi-experimental design with a pretest-posttest. It was quasi-experimental in nature because two intact groups of respondents were used; one was the control group, which received conventional instruction, and the other was the experimental group, which received concept-oriented reading instruction. Before the experiment began, both groups completed the Philippine Informal Reading Inventory (Phil-IRI) to ascertain the students' reading ability. The researcher-made test was used to determine the student's cognitive achievement.

The study took place at Fr. William F. Masterson, S.J. Elementary School, which was previously known as KM 5 Elementary School. The participants were the 72 fourth-grade students during the academic year 2020-2021. The conventional group consists of 36 students, whereas the experimental group consists of 36 students. The experimental group received lessons via online concept-oriented reading instruction (CORI), whereas the conventional group received lessons via modular instruction using the Department of Education modules.

The study used a teacher-made questionnaire that was validated by three experts from the Department of Education and the University of Science and Technology of Southern Philippines. Explicit Reading Instruction has been built upon principles of Concept-Oriented Reading Instruction (CORI) which is an instructional approach that allows students an opportunity to engage in reading informational texts when using hands-on activities and fostering collaboration. Concept-Oriented Reading Instruction (CORI) advocated by Guthrie, McRae and Klauda (2007) incorporated classroom practices that combined reading strategy instruction, motivational-engagement supports, and content goals [10]. CORI's guiding principles comprise (1) explicit instruction in significant reading strategies on a continual basis, (2) an emphasis on vocabulary development, (3) a range of coherent contents, materials and student choices, (4)

reading fluency practices, (5) time for extensive reading and (6) integrated reading-writing tasks.

The Phil-IRI was administered using a standardized test developed by the Department of Education. The Phil-IRI is an informal reading inventory composed of graded passages designed to assess an individual's oral reading, silent reading, and listening comprehension abilities. These three types of assessments are designed to ascertain the student's level of independence, instruction, and frustration. The participants were chosen on purpose using intact group sampling for the experimental and control groups. The number of frequencies of responses for each question was used to score the questionnaire.

RESULTS AND DISCUSSION

Reading Comprehension Skills of Learners Based on the Philippine Informal Reading Inventory (Phil-IRI)

The Philippine Informal Reading Inventory (Phil-IRI) is a project of the Department of Education's Bureau of Learning Delivery that directly addresses the department's mission to make every Filipino child a reader. It is built around the Department's flagship program, "Every Child A Reader," which aims to make every Filipino child a reader and writer at his or her grade level. The Phil-IRI is an informal reading inventory comprised of graded passages designed to assess an individual's oral reading, silent reading, and listening comprehension abilities. These three types of assessments are designed to ascertain the student's level of independence, instructional ability, and frustration. Table 1 summarizes the students' reading comprehension levels as measured by the PHIL-IRI prior to the implementation of CORI. As can be deduced, only 29% of students qualify as independent readers. This means that approximately three out of every ten fourth-grade students at Father William F. Masterson, SJ Elementary School are capable of reading independently with near-perfect reading and comprehension. These students are capable of reading independently of the assistance or guidance of a teacher. On the other hand, 40.3 percent of students are classified as having an Instructional reading level. This result indicates that approximately four out of every ten grade IV students have less reading comprehension ability and are more reliant on teacher-directed reading instruction. Additionally, 30.6 percent of students have reading and comprehension skills at the Frustration level. These are students who have difficulty reading and are unable to comprehend what is being read.

Table 1. Reading Comprehension Skills of Learners: Phil-IRI Results

	Frequency	Percent
Frustration (58% and below)	22	30.6
Instructional (59% - 79%)	29	40.3
Independent (80% - 100%)	21	29.2
Total	72	100

Students in Grade IV are expected to be proficient in reading and comprehension. This level signifies that student can now read independently and with comprehension. However, 30.6 percent at the frustration level deviates significantly from the expectation. Without

comprehension, reading becomes a pointless and frustrating exercise in word calling. It is not hyperbole to assert that how well students develop their ability to comprehend what they read has a profound impact on their entire lives. Thus, a primary goal of reading comprehension instruction is to assist students in acquiring the knowledge, skills, and experiences necessary to develop into competent and enthusiastic readers. Thus, the school's goal is to have instructional readers, more independent readers, and zero frustration level readers. When there are a large number of independent readers, it results in a higher score on national and international achievement examinations. The CORI is one strategy that has the potential to significantly improve students' reading comprehension abilities and achievement scores.

Concept Oriented Reading Instructions (CORI)

Reading Comprehension Skills

Table 2 presents the reading comprehension abilities of students exposed to two different types of instruction: conventional and CORI. As indicated, the conventional teaching approach has 19 students (52.8%) who fall into the Frustration level, 7 students (19.4%) who fall into the Instructional reading level, and 10 students (27.8%) who fall into the Independent reading level. This indicates that a greater proportion of students are reading at the Frustration level when using the conventional method. On the other hand, the Concept-Oriented Reading Instruction (CORI) has resulted to fewer students in the Frustration level at 8.3 %. The greater percentage of students exposed to CORI were in the Independent level at 30.6 % and the highest were in the Instructional level at 61.1%.

Table 2: Reding Comprehension Skills of Learners Exposed to the Two Learning Approaches

Level of Comprehension	The comprehension level of the pupils exposed to Conventional Way		The comprehension level of the pupils exposed to CORI	
	Frequency	Percent	Frequency	Percent
Frustration	19	52.8	3	8.3
Instructional	7	19.4	22	61.1
Independent	10	27.8	11	30.6
Total	36	100	36	100

According to the statistical analysis shown in Table 3, the mean reading comprehension score of students exposed to CORI is significantly higher than the mean reading comprehension score of students exposed to the conventional method of instruction. This result demonstrates unequivocally that CORI improves students' reading comprehension abilities. Vongkrachang and Chinwonno (2015) examined the effect of explicit reading instruction on EFL students' comprehension and engagement with informative texts using the Concept Oriented Reading Instruction (CORI) paradigm. Students' reading comprehension and participation increased as a

result of the implementation. Additionally, there were significant differences in the mean scores of the students' pre- and post-tests. The Reading Engagement Index (REI) and Reading Engagement Checklist revealed that behavioral, emotional, and cognitive engagements improved significantly [10].

Table 3. t-Test Results on the Reading Comprehension Skills of Learners: Conventional vs. CORI

	Mean Score (±sd)	t	df	p-value
The reading comprehension level of the learners exposed to CORI	2.22 (±0.59)			
The reading comprehension level of the learners exposed to conventional way	1.75 (±0.87)	2.683	70	0.009

α = 0.05

Explicit Reading Instruction is founded on the principles of Concept-Oriented Reading Instruction (CORI), an educational strategy that motivates students to read informative materials through hands-on activities and collaboration. Guthrie, McRae, and Klauda (2007) proposed Concept-Oriented Reading Training (CORI), which involved integrating reading technique instruction, motivational-engagement aids, and content objectives into classroom approaches. CORI is guided by the following principles: (a) continuous explicit instruction in significant reading strategies; (b) an emphasis on vocabulary development; (c) a variety of coherent contents, materials, and student choices; (d) reading fluency practices; (e) time for extensive reading; and (f) integrated reading-writing tasks [11].

Science Achievements of Learners

The mean science achievement scores of students exposed to the two teaching approaches are shown in Table 4. In terms of impact on science achievement, the CORI is on a par with traditional teaching methods. As demonstrated in Table 5, there is no statistical difference in science achievement between groups of students exposed to two distinct instructional approaches (p-value 0.143).

Table 4. Science Achievements of Learners Exposed to the Two Learning Approaches

Teaching Approach	Pre-Test (x̄ ± sd)	Post-Test (x̄ ± sd)
CORI	18.15 ± 6.00	23.31 ± 6.84
Conventional	10.18 ± 7.04	27.71 ± 5.57

Table 5. Analysis of Covariance on the Science Achievements of Learners: Conventional vs. CORI

Source	DF	Adjusted SS	Adjusted MS	F-value	P-value
Pre-Test	1	1.86	1.861	0.05	0.829
Method	1	88.98	88.981	2.28	0.143
Error	27	1054.44	39.053		
Total	29	1198.80			

The above findings appear to be inconsistent with the findings about CORI in the literature regarding scientific achievement. In one meta-analysis, CORI was found to be significantly more effective than traditional instruction at improving certain cognitive variables such as knowledge acquisition and transfer tasks in life science topics [11].

The effect of CORI on student achievement can be assessed using alternative measures such as the student's ability to answer questions, summarize and graphically organize information, rather than solely on the basis of written exam scores, which is essentially the limitation of the current study. Nonetheless, the study demonstrated the superiority of CORI over traditional or conventional instruction by significantly improving the students' reading comprehension skills.

CONCLUSION

As an intervention, Concept-Oriented Reading Instruction (CORI) has been shown to improve Grade IV students' reading comprehension skills. In reading comprehension, the group of students exposed to CORI achieved a significantly higher mean score than the group taught conventionally. In terms of student achievement in science, the CORI is just as effective as conventional teaching methods. The CORI, therefore, can be used as an intervention strategy or as an integral part of the teaching-learning process to help students improve their reading comprehension skills and academic performance.

REFERENCES

- [1] Dadzie, P. S. (2008) Reading for Education: The roles of Libraries. *Ghana Library Journal* Vol. 20. No. 1. pp. 1-14
- [2] Palani, K. K. (2012) Promising Reading Habits and Creating Literate Social. *International Reference Research Journal* Vol. III Issue 2(1) pp 91.
- [3] Deavers, R. (2000) The Effect of Instruction on Early Non-Word Reading Strategies. *Journal of Research in Reading*. No.23, pp 267-286.
- [4] Palani, K. K. (2012) Promising Reading Habits and Creating Literate Social. *International Reference Research Journal* Vol. III Issue 2(1) pp 91.
- [5] Issa, A. O., Aliyu, M. B., Akangbe, R. B. & Adedeji, A. F.(2012) Reading Interest and Habits of the Federal Polytechnic Students. *International Journal of Learning & Development*.Vol.2, No.1, pp 470-486.
- [6] Meyer, B. J., Wijekumar, K., Middlemiss, W., Higley, K., Lei, P. W., Meier, C., & Spielvogel, J. (2010). Web-based tutoring of the structure strategy with or without elaborated feedback or choice for fifth-and seventh-grade readers. *Reading Research Quarterly*, 45(1), 62-92.
- [7] Ozuru, Y., Dempsey, K., & McNamara, D. S. (2009). Prior knowledge, reading skill, and text cohesion in the comprehension of science texts. *Learning and instruction*, 19(3), 228-242.
- [8] Guthrie JT, Wigfield A, You W, (2012). Instructional contexts for engagement and achievement in reading. In: Christenson SL, Reschly AL, Wylie C, editors. *Handbook of research on student engagement*. New York, NY: Springer; 2012. pp. 601–634
- [9] The Programme for International Student Assessment (PISA) PISA 2018 National Report of the Philippines
- [10] Vongkrachang, S., & Chinwonno, A. (2015). CORI: Explicit Reading Instruction to Enhance Informational Text Comprehension and Reading Engagement for Thai EFL Students. *PASAA: Journal of Language Teaching and Learning in Thailand*, 49, 67-104.
- [11] Guthrie, J. T., McRae, A., & Klauda, S. L. (2007). Contributions of Concept-Oriented Reading Instruction to knowledge about interventions for motivations in reading. *Educational Psychologist*, 42, 237 - 250.