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Unlocking the Power of Schema Theory based Pre-Reading Activities: Enhancing Reading Comprehension at the Intermediate Level

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Abstract: *The study evaluated the efficacy of schema theory-based pre-reading activities in enhancing intermediate-level reading comprehension. The study was conducted solely on first-year English students at GHSS Togh Bala Kohat. The study involved 60 first-year students, divided into two groups of 30 participants each. The study employed two groups, a control group and an experimental group. The experimental group underwent five English lessons utilizing schema theory-based brainstorming activities while the control group received traditional instruction. Pre- and post-tests were administered to students to evaluate their performance and assess the outcomes of schema theory-based pre-reading exercises. The collected data were analyzed through SPSS. The study revealed that incorporating schema theory-based pre-reading exercises in teaching resulted in superior academic performance of students compared to those who were not exposed to such activities. After a period of four months, retention tests were conducted once more. The findings indicated that Schema-based pre-reading exercises improved students' performance.*

Key Words: Schema Theory, Cognitive Theory, Pre-Reading Activities,

Introduction

When youngsters inquire about the greatness of Allah, it can be difficult to convince them due to their limited understanding of the word "great." In their thoughts, great things are mountains, trees, buildings, or their parents, and if Allah's greatness is not compared to these things, they will be unable to comprehend the concept of God. Bartlett and Piaget introduced schema theory, which pertains to children's prior knowledge. If teachers are to teach anything, they must consider the student's prior knowledge. It is a crucial instrument for effective and persuasive teaching.

According to schema theory, individuals rely on schemas to make sense of the world around them. Schemas are a representation of an individual's understanding, convictions, and anticipations regarding the world. Their approach helps to organize and simplify the vast amounts of

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information that individuals come across on a daily basis. According to schema theory, schemas are mental representations that undergo changes when new information is processed. Schemas are mental models that operate automatically and have an impact on our thoughts, emotions, and behaviours. Schemas aid individuals in organizing, interpreting, and comprehending information. Schemas are shaped by experiences and can be altered when new knowledge is acquired. Schemas have the ability to activate perception, memory, and behaviour. Schema theory has been applied in the fields of education to enhance teaching and learning, as well as in social psychology to gain insights into stereotypes and prejudice. Schema theory is a widely recognized concept that highlights the significance of cognitive processes and human behaviour across various fields of study. Schema theory is a useful tool for understanding how we process and interpret information. This statement highlights the significance of preconceived notions in shaping one's perception, memory, and behaviour.

Developing reading skills is essential for anyone learning English. Although we cannot physically sense the connection between input and output, it is widely recognised that language comprehension plays a vital role in effective communication (An, 2013). Schema theory advocates using external and internal schemata to grasp a message. Reading requires underlying information and gives readers ideas. It's been found that familiarity with the formal structure, genre, and subject matter all help with comprehension. Schemata theory emphasizes knowledge and experience schemas to promote reading comprehension. Reading requires short-term and long-term memory (Carrell, 1988). Working memory holds 7 things. If not integrated with permanent memory or regularly practised, this limited working memory information can be forgotten in "20-30 seconds" (Reed, 1989). Learning requires moving something from working memory, which has limited space and time, to permanent memory. The second type of transference is illogical, like a youngster who deliberately recites a poem over and over again in order to memorize it. It'll waste time. (Goodman, 1997) transference is not reading. Reading in this sense includes connecting new and old knowledge. How does reading aid memory? Ausubel's assimilation theory (Ausubel, 1980), the "A" symbolizes the reader's knowledge schema and the "a" represents new information. "Relating the symbolically expressed ideas in a non-arbitrary and substantive fashion" (Ausubel, 1980) to the reader's background knowledge makes the new ideational output cohesive. The mind permanently incorporates this new meaning.

According to (Marshall, 1995), Schema has its roots in the works of Plato and Aristotle. According to Johnson (2005), Kant (1929) first introduced the concept of schemas as structures that aid in our ability to arrange and comprehend the world. According to (Campbell, Halpin, & Proper, 1996), schemas refer to mental biases. According to Kant's philosophy, there is a schema that acts as a mediator between the external and internal mental systems. One's experiences shaped and reflected them. In 1932, introduced the concept of schema. Later, in 1995, he conducted a study on how schemas function as cultural elements in memory (Bartlett & Bartlett, 1995). As (Saito, 2000) emphasized that the work of cognitive-era schema theorists has been commonly used. Bartlett's study and writing suggest that schemas are not solely mental processes. According to (Saito, 2000), these are social and cultural trends. The early emphasis of schema theory was on external mental processes, which is evident from Bartlett's research. According to (Middleton & Crook, 1996), Bartlett viewed schema as an "organised setting" rather than a fixed aspect of the mind (Bartlett & Bartlett, 1995). According to Bartlett, schemata are not structures of knowledge that individuals store in their minds to comprehend experiences. They don't treat medical conditions but rather help individuals adapt to their physical and social circumstances.

Piaget's cognitive theory of 1952 focused on schemas, which are mental frameworks that individuals utilize to assimilate new experiences. Piaget emphasized the significance of sensory-motor schemas and the process of schema formation during early development. Despite his idiosyncratic approach, akin to that of numerous cognitive scientists, he appeared to have overlooked the developmental and embodied dimensions of schemas (Piaget & Cook, 1952). In

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order for students to infer meaning beyond what is explicitly stated in the text, they must possess a functional schema. Without this, inferring becomes an impossible task. The reader constructs the meaning of a text by considering both the textual clues and their own knowledge and experiences. (Mills, 2019). The majority of students in Kohat, a small town located in Khyber Pakhtunkhwa, hail from underprivileged rural regions where they speak a language that has remained isolated from the rest of the world. The poor typically have a smaller vocabulary and fewer life experiences, both of which contribute to a lack of context. (Price, 2010). Teaching schema activation is necessary for improving text comprehension. Low-income students can improve their ability to prepare for the elaboration stage (also known as inferencing) if they are taught schema explicitly to enhance their metacognition and are encouraged to concentrate on a stimulus. (Price, 2010). Incorporating multiple senses in educational courses can aid in the development of schema. Providing enhanced educational opportunities can help children from disadvantaged backgrounds to learn and succeed. These activities are referred to as "direct approaches" to context in literature. (MUSMAR, 2019). Language, content, and formal schema are the three main categories (Carrell, 1988). Before, during, and after reading, students can benefit from employing visual organisers such as (KWL), where K stands for “What I Know”, W for “What I Want to Know”, and L for “What I Learned” The results of a knowledge assessment can be very helpful in guiding training and stimulating interest. Teachers might use "What I Learned" recordings to assess their students' understanding and shape future classes accordingly. Students' understanding and memory were enhanced when visual organizers were used in the classroom. (Ellis & Robinson, 2008). Text linkages serve to organize background knowledge. Individuals who experience difficulties with reading comprehension often exhibit a tendency to read hastily, neglecting to pause and evaluate the coherence of the text or to consider how their prior knowledge may aid in its comprehension (Zygouris-Coe, 2009). The acquisition of a more profound understanding of the content can be facilitated among students through instruction on how to establish significant associations with the reading material (Harvey & Goudvis, 2007). Readers are more likely to be interested in material that they can relate to. Textual connections between texts are commonly referred to as "text-to-text," while connections between a text and the world are known as "text-to-world." (Draper, 2010).

(Bransford & Johnson, 1972, 1973) were the pioneer, who mentioned the schemas in L1 reading comprehension, then in EFL/ESL reading. EFL/ESL reading linguists and practitioners agree that prior knowledge is as crucial as language problems. Numerous research (e.g. (Barrios Espinosa, 1996; Carrell, 1988; Hudson, 1988; Liu, 2015; Mann, Beech, Ward, Laws, & Hudson, 2002; Stott, 2001) indicated that background knowledge is more likely to affect reading comprehension than language competence/complexity. (Nishida, 2005) tried to make the relationship between culture and schema theory. Some other studies also established the relationship of schema theory with other variables like (Ajideh, 2003; An, 2013; Nassaji, 2002). Although prior research has indicated the significance of pre-existing knowledge for the comprehension of language learners, further inquiry into this matter is necessary. The study's goal is to establish if and how schema-based pre-reading exercises help students at the intermediate school level.

Objectives of the Study

1. To investigate how pre-reading tasks and activities based on the schema theory affect the improvement of reading comprehension.
2. To compare, after completing pre-reading tasks based on the schema theory, the low and high-achieving students’ reading comprehension.

Hypothesis of the Study

H1: Pretest data shows no substantial variations between control and treatment groups.

H2: Pretest data shows no substantial variations between the low achievers of control and treatment groups.

H 3: Pretest data shows no substantial variations between the high achievers of control and treatment groups.

H4: Posttest data shows no substantial variations between control and treatment groups.

H5: Posttest data shows no substantial variations between the low achievers of control and treatment groups.

H6: Posttest data shows no substantial variations between the high achievers of control and treatment groups.

Sample and Sampling Technique

The researchers used a Two-Group Pre-Test-Post-test equaling experimental Design and non-randomized samples were selected based on their previous SSC Annual Exam marks. The pre-test included the first 5 lessons of the English textbook, and only the experimental group received the schema theory-based pre-reading tasks. Both groups then took a post-test after treatment ended to see how the pre-reading activities affected the dependent variable (reading comprehension). The study was limited to 60 students, divided into two groups of 30 students each. The English course was compulsory for all first-year students.

Research Instruments

The researchers constructed strategies/tasks/activities for five lessons of intermediate English textbook 1 of Khyber Pakhtunkhwa using Bartlett schema theory and Barrett Taxonomy of cognitive and affective. The pre-test consisted of the first five lessons of the first-year English textbook, which pupils had already learned. There were no pre-reading exercises. After the pre-test, the experimental group received 15 minutes of previewing, questioning, and key vocabulary, while the control group received normal training. Barrett's taxonomy's cognitive and affective categories informed the post-test design. The process of literal understanding involves gathering data, identifying important concepts, following a logical sequence, and establishing relationships between them. (2) Reorganising through categorization, outlining, summarising, and synthesising. Thirdly, inferential comprehension involves drawing conclusions about key ideas, sequences, comparisons, and causes based on supporting details. The fourth concept pertains to evaluating reality, value, truth, preference, viewpoint, and suitability. Appreciation refers to the emotional connection established between the story and the author's style, which can result in a favourable or unfavourable reaction. Before both the tests Pretest and Posttest, topic experts examined both tests for content and face validity and made changes based on their recommendations.

The Procedure of the Study

The study examined the effect of schema-based pre-reading tasks on reading comprehension among first-year English students at GHSS Togh Bala Kohat, Khyber Pakhtunkhwa. The data collection process involved administering a reading comprehension test to a sample of 60 students. The students were divided into control and experimental groups based on their previous exam marks. The control group was kept with routine teaching while the experimental group was taught using schema theory as a part of the treatment. This involved various sub-steps such as prediction, discussion, brainstorming, K-W-L Plus, skimming, real-life experience, vocabulary teaching in context, and questioning. The treatment spanned over a period of eight weeks and had the objective of utilizing and stimulating prior knowledge to facilitate comprehension. The discussion was stimulated by asking thought-provoking questions, and the comprehension questions required critical, inferential, and literal thinking. Treatment effectiveness was assessed through pre-test and post-test score comparison.

Pre-Test Data Analysis

Both the control and experimental groups took a pretest to ensure that their beginning academic achievement was equal. Below is a detailed analysis and interpretation of the results

H1: Pretest data shows no substantial variations within the control and treatment groups.

Table 1

Pretest results comparing the control group with the experimental group

Independent Samples Test										
t-test for Equality of Means							Levene's Test for Equality of Variances			
Groups	N	Mean	Mean Difference	Std Deviation	Groups	Df	F	Sig.	T	Sig. (2-tailed)
Control Group	30	45.0	-.33	18.23	Equal variances assumed	58	064	.801	-.070	.944
Experimental Group	30	45.33		18.61	Equal variances not assumed	57.9				

A t-test for independent samples was used to compare the pre-test results of the two groups. (t (58) =.801) The two categories' performances did not noticeably differ from one another. The control group's standard deviation was 18.23, while the experimental group's was 18.61. Between the two categories, the average was 45. The observed mean difference (mean = -0.33, 95% CI = -1.12, 0.46), however, was not statistically significant. The null hypothesis is accepted since the evidence does not support the alternative explanation.

H2: Pretest data shows no substantial variations within the low achievers of control and treatment groups.

Table 2

Pretest results comparing the low achievers of the control group with the experimental group

Independent Samples Test										
t-test for Equality of Means							Levene's Test for Equality of Variances			
Groups	N	Mean	Mean Difference	Std Deviation	Groups	Df	F	Sig.	T	Sig. (2-tailed)
Control Group	10	23.90	.30	9.20	Equal variances assumed	18	.002	.965	.074	.942
Experimental Group	10	23.60		8.88	Equal variances not assumed	17.97				

A t-test for independent samples was used to look into the variance in pre-test results between the two groups. T (18) = 0.965 shows that neither group significantly outperformed the other. The experimental group's mean score was 23.60, while the control group's mean score was 23.90, a difference of 9.20 standard deviations. The groups' performance levels did not differ significantly from one another. At a 95% level, the mean difference confidence interval was 0.30. No proof of statistical significance could be found. Since there was no observable difference between the test and control groups during the pre-testing period, the null hypothesis can be accepted.

H 3: Pretest data shows no substantial variations within the high achievers of control and treatment groups.

Table 3

Pretest results comparing the high achievers of the control group with the experimental group

Independent Samples Test										
t-test for Equality of Means					Levene's Test for Equality of Variances					
Groups	N	Mean	Mean Difference	Std Deviation	Groups	Df	F	Sig.	T	Sig. (2-tailed)
Control Group	10	64.80		2.93	Equal variances assumed	18				
Experimental Group	10	64.80	.00	3.39	Equal variances not assumed	17.63	.043	.839	.000	1.00

The preliminary examination was administered to both the control and experimental groups, and the outcomes were compared using a t-test for independent samples. (t (18) =.839) Both groups' outcomes were statistically equal. In comparison to the control group, which averaged 64.80 points with a standard deviation of 2.93, the experimental group had a standard deviation of 3.39. The means were statistically indistinguishable (95% CI = 0). The null hypothesis can be accepted because there were minimal differences between the two groups' pre-test scores.

Post-test Analysis

Post-tests were administered to both the control and experimental groups to assess the academic progress of the sample students after the intervention period. The following section presents an analysis and explanation of the obtained results.

H4: Posttest data shows no substantial variations within the control and treatment groups.

Table 4

Posttest results comparing the control group with the experimental group

Independent Samples Test										
t-test for Equality of Means					Levene's Test for Equality of Variances					
Groups	N	Mean	Mean Difference	Std Deviation	Groups	Df	F	Sig.	T	Sig. (2-tailed)
Control Group	30	46.26		17.72	Equal variances assumed	58				
Experimental Group	30	65.03	-18.76	14.29	Equal variances not assumed	55.50	2.068	.156	-4.51	.000

A preliminary analysis was performed on both the control and experimental groups, and the outcomes were compared using a t-test for independent samples. The mean scores of the experimental group (65.03 vs. 46.26) were substantially higher than those of the control group (65.03 vs. 46.26) (t(58) =.156). The difference between the means has a 95% confidence interval of -18.76, which is statistically significant. The figures show that the

experimental group outperformed the control group in terms of performance. If a post-test indicates a statistically significant difference between the experimental and control groups, the null hypothesis can be rejected.

H5: Posttest data shows no substantial variations within the low achievers of control and treatment groups.

Table 5

Posttest results comparing the low achievers of the control group with the experimental group

Independent Samples Test										
t-test for Equality of Means					Levene's Test for Equality of Variances					
Groups	N	Mean	Mean Difference	Std Deviation	Groups	Df	F	Sig.	t	Sig. (2-tailed)
Control Group	10	25.80	-22.80	8.89	Equal variances assumed	18	1.893	.186	-6.57	.000
Experimental Group	10	48.60		6.41	Equal variances not assumed	16.37				

The outcomes of the pre-test were compared between the two groups using a paired t-test. Generally speaking, the experimental group outperformed the control group. The mean for the Experimental Group was M = 48.26 (SD = 6.41), whereas the mean for the Control Group was M = 25.80 (SD = 8.89). The difference is significantly different from zero, according to the t-test with 18 degrees of freedom (t =.186). Between the groups, there was a statistically significant mean difference (22.80, 95% CI). In comparison to the control group, the individuals in the experimental group with the lowest pre-test scores showed the greatest improvement. The findings disprove the notion that the poor achiever experimental and control groups' post-test scores are comparable.

H6: Posttest data shows no substantial variations within the high achievers of control and treatment groups.

Table 6

Posttest results comparing the high achievers of the control group with the experimental group

Independent Samples Test										
t-test for Equality of Means					Levene's Test for Equality of Variances					
Groups	N	Mean	Mean Difference	Std Dev.	Groups	df	F	Sig.	t	Sig. (2-tailed)
Control Group	10	65.60	-14.60	2.98	Equal variances assumed	18	7.076	.016	-6.61	.000
Experimental Group	10	80.20		6.30	Equal variances not assumed	12.85				

A t-test was used to compare the two groups' pre-test results, with one group serving as the control and the other as the experimental group. The experimental group exhibited lower standard deviation and mean scores compared to the control group (6.3% and 80.20, respectively; t (18) =.016). The groups did not differ significantly, with a mean difference of -14.60 at a 95% confidence level. The experimental group's top performers outperformed their control group counterparts on the final exam. Thus, the null hypothesis of equivalence is rejected based on their results.

Discussions

The majority of English textbook lessons in Pakistan are derived from English literature originating from the United States or other nations. The vocabulary and contextual elements presented in these lessons are exclusively linked to the cultural backgrounds of these sources. The lack of a prior knowledge framework for the vocabulary among our students has resulted in difficulties in comprehending the lessons and a general aversion towards reading textual material. The researcher faces a challenge when delivering the lesson on "The Way It Was and Is" by Bill Cosby to intermediate-level students. The writer cited Duke Ellington, Count Basie, and Jimmie Lunceford as representatives of the initial cohort, while Sonny Rollins, John Coltrane, Dizzy Gillespie, Thelonious Monk, Bud Powell, and Philly Joe Jones were identified as members of the subsequent cohort. The scholar curated two compilations of Pashtu vocalists spanning two eras as a means of preventing student disinterest. Consequently, the researcher was well-received by the students and the acquisition of knowledge occurred at a swift pace. Schemas' "anchoring ideas" aid assimilation. As you read, larger, more integrated schemata for assimilating new knowledge lower cognitive load and free up working memory. It's wonderful for brainstorming. Thus, the relevant schema fixes working memory. Without schema, readers cannot remember this information. When learning is simply memorization-based, routines are "incorporated into the cognitive structure in the form of arbitrary associations" (Ausubel, 1980). Readers' preconceptions don't affect these linkages. However, several tests, including this one, have shown that humans are particularly bad at distinguishing arbitrary from literal relationships. Reading will strain working memory. Reading with the right schema integrates new material into old knowledge in a substantive and non-arbitrary way, minimizing the working memory burden. Reading without schema slows working memory. Recalling information without context is hard to understand. This study is in line with the studies of (Altarriba & Forsythe, 1993; Erten & Razi, 2009; Fuhong, 2004; Pritchard, 1990; Reynolds, Taylor, Steffensen, Shirey, & Anderson, 1982).

Findings and Implications

Schema theory-based pre-reading activities were found to be effective in enhancing reading comprehension in secondary school students. The study showed that these activities improved student engagement, attention, and learning outcomes. Additionally, the student-centred approach, which included prediction, questioning, KWL-Plus, and brainstorming activities, proved beneficial for both high and low achievers. The results also indicated that schema theory-based teaching was superior to traditional teaching methods. Teachers must be trained to use schema theory techniques to help students understand the content. They must also be sensitive to potential comprehension difficulties due to cultural differences. Teachers with a sound knowledge of the target culture can facilitate comprehension among students. In conclusion, schema theory-based pre-reading activities can enhance students' reading comprehension, and language teachers must be trained and equipped to use them effectively. Based on the study's findings, it is recommended that the schema theory technique be employed when teaching reading comprehension. Teachers should guide students on how to apply their background knowledge to understand the text. The following schema procedures can be used to develop reading comprehension:

1. Brainstorming around the topic
2. Writing related lexical items
3. Discussing issues related to the reading comprehension passage
4. Allowing students to visualize related issues
5. Reading the comprehension passage silently
6. Making a text-to-self connection
7. Making a text-to-text connection
8. Making a text-to-world connection
9. Attempting the reading comprehension questions
10. Encouraging analytical thinking with provoking questions and using pictures and titles of passages to spur understanding.

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