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EFFECT OF COGNITIVE ACTIVATION STARATEGIES ON ANALYSIS SKILLS AT SECONDARY LEVEL IN PUNJAB, PAKISTAN

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ABSTRACT

The research employs a quantitative approach, employing a pre-test-post-test control group design to assess efficacy of cognitive activation strategies in enhancing the students' analytical prowess. A sample of secondary level students was randomly assigned to the experimental and control groups. The experimental group endured targeted interventions including cognitive activation strategies, while control group followed conventional teaching methods. Both groups were subjected to pre & post-intervention assessments, focusing on analytical skills in the context of English education. Findings reveal a significant improvement in analytical abilities among the students exposed to cognitive activation strategies compared to those in the control group. This improvement was shown through standardized tests, observation, and qualitative analysis of student work. The implications of these findings underscore imperative for educators to mix cognitive activation strategies into pedagogical practices to optimize students' analytical skills in English education at secondary level. This study contributes to burgeoning discourse on effective teaching practices, providing empirical evidence to support the adoption of cognitive activation strategies in fostering analytical skills amid students in Punjab Pakistan.

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INTRODUCTION

The existing research showed that revealing the most effective learning techniques is crucial for fostering academic success and students' wellbeing (Martín, Fernando & Marta, 2024). In landscape of secondary education, the cultivation of analysis skills holds paramount significance for fostering the cognitive development and academic proficiency amid the students (Cantley, Prendergast & Schlindwein, 2017). Mastery of analytical competencies not only bolsters comprehension but also

equips students with ability to scrutinize information critically, formulate hypotheses, and navigate complex textual landscapes effectively (Anderson, 2001). To address this educational imperative, integration of cognitive activation strategies (CAS) emerges as promising avenue for augmenting analysis skills among secondary level learners within English subject domain. Cognitive activation strategies include an array of instructional methodologies crafted to engage students in cognitively demanding tasks, by catalyzing higher-order cognitive processes to inspires the students to analyze and evaluate arguments, identify assumptions, and differentiate between fact and opinion. (Hattie, 2009). These strategies, deeply rooted in cognitive psychology and educational theory, leverage principles such as cognitive load, schema theory, and metacognition to optimize learning outcomes in English classroom.

The research substantiates potential of CAS to significantly enhance analysis skills amid secondary level students, particularly within the domain of English education. By prompting students to actively deconstruct and interpret textual content, make inter textual connections, and engage in reflective discourse, CAS facilitate profound levels of textual understanding & foster development of critical thinking proficiencies (Mayer, 2012). A burgeoning body of empirical evidence attests to the efficacy of CAS in bolstering analysis skills within the English subject domain. Recent studies highlight effectiveness of instructional approaches like text-based questioning, Socratic seminars, collaborative annotation, and creative writing tasks in nurturing the students' capacity for textual analysis, interpretation, as well as evaluation (Perkins, 2005). Furthermore, the advent of the digital technologies has expanded the repertoire of CAS available to educators, offering the interactive multimedia resources, digital texts, online collaborative platforms, and the adaptive learning tools tailored to the intricacies of the English language and literature. These technological innovations not only boost student engagement but also afford opportunities for personalized instruction and real-time feedback, thereby amplifying the impact of CAS interventions in the English classroom (Slavin, 2014).

By amalgamating insights from the cognitive science, educational psychology, and instructional design, educators can tailor CAS to meet the diverse needs and learning objectives of their students, fostering a culture of critical inquiry, textual analysis, and linguistic proficiency (Sweller, 2010). In realm of secondary education, fostering students' analytical skills is paramount for their cognitive development and academic success. To this end, employing cognitive activation strategies (CAS) has emerged as the promising approach to augmenting analytical capabilities amongst secondary level learners. The cognitive activation strategies encompass a variety of instructional techniques designed to engage students in cognitively demanding tasks, thereby stimulating the higher-order thinking processes. These strategies are rooted in cognitive psychology and educational theory, leveraging principles of cognitive load, schema theory, and metacognition to optimize learning outcomes (Zimmerman, 2008). Research indicates that the implementation of CAS in secondary education can significantly enhance students' analysis skills across various domains. By prompting students to actively construct meaning, connect prior knowledge with new information, and engage in reflective inquiry, CAS facilitate deeper understanding and promote the development of critical thinking competencies.

Objectives & Hypothesis

The objective of study was to examine impact of cognitive activation strategies on enhancement of analysis skills amid secondary school students. This research aims to investigate specific cognitive activation strategies that effectively promote higher order thinking skills in context. Therefore, the objectives include:

1. The objectives of study are to examine effect of cognitive activation strategies on analyzing skill of secondary level students in subject of English.
2. The hypothesis of present research study is there is no effect of cognitive activation strategies on analyzing the skill of 9th grade students in English.

LITERATURE REVIEW

The effectiveness of CAS in fostering analysis skills at the secondary level has been substantiated by a growing body of the empirical evidence. Recent studies have demonstrated that instructional approaches such as problem-based learning, inquiry-based learning, concept mapping, Socratic questioning, and collaborative learning can lead to substantial improvements in students' ability to analyze, evaluate, and synthesize information (Woolfolk 2008). Moreover, the advancements in the educational technology have expanded the repertoire of CAS available to educators, offering the interactive simulations, multimedia resources, virtual laboratories and adaptive learning platforms that cater to diverse learning styles and preferences. These digital tools not only facilitate active engagement but also enable personalized instruction and real-time feedback, thereby optimizing the efficacy of CAS interventions. Analytical prowess not only enhances comprehension but also enables students to critically evaluate the information, formulate hypotheses, and solve complex problems. In light of the evolving educational landscape, it is imperative to continually assess and refine the implementation of CAS to maximize their impact on analysis skills development at the secondary level.

By integrating insights from cognitive science, educational psychology, and instructional design, educators can tailor CAS to address the detailed needs and learning objectives of their students, fostering a culture of inquiry, critical thinking, and lifelong learning. The integration of cognitive activation strategies in the secondary level English education in Punjab represents a pedagogical imperative aimed at enhancing the students' analysis skills within the context of English language acquisition. This rationale delineates the contextual significance and theoretical underpinnings supporting utilization of CAS to foster analysis skills development among secondary level English learners in Punjab, grounded in the empirical research and educational theory. English serves as a second language in the Punjab, presenting students with the linguistic challenges that impede their comprehension and analysis of English texts. Research shows that learners struggle to navigate the syntactic and semantic intricacies of the English literature due to limited proficiency (Zulfiqar & Shahbaz, 2020). By integrating CAS tailored to linguistic needs of students, educators can scaffold their analysis skills development, facilitating deeper engagement with English texts & mitigating language-related barriers.

Against the backdrop of an evolving educational landscape, continual assessment and refinement of CAS implementation are imperative to maximize their efficacy in enhancing the analysis skills

among secondary level English learners. The prevailing educational paradigm in Punjab tends to prioritize rote memorization over critical thinking and inquiry-based learning. However, fostering critical thinking skills is essential for the effective textual analysis and interpretation. CAS, such as text-based questioning and collaborative discourse, promote the active cognitive engagement and reflective inquiry (Morgan, 2021). By encouraging students to interrogate texts, evaluate evidence, and articulate reasoned interpretations, CAS cultivate critical thinking competencies conducive to analysis skills development. The students learn to monitor their own thinking processes, recognize their strengths and weaknesses, and adjust strategies accordingly fostering a deeper understanding of subject matter. Socio-cultural context of Punjab shapes students' perceptions and interpretations of English literature. Integrating CAS allows the educators to contextualize English texts within the socio-cultural milieu of Punjab, making them more relevant and meaningful for students (Bokhari & Mahmood, 2019).

By facilitating discussions on the themes, values, and perspectives resonant with the students' lived experiences, CAS promote deeper textual analysis and interpretation, fostering socio-culturally responsive pedagogy. The curriculum framework for English education in Punjab underscores the importance of analytical skills, critical literacy, and communicative competence. CAS align closely with these curriculum objectives, offering pedagogical strategies conducive towards analysis skills development (Rashid & Siddiqui, 2018). By integrating CAS into instructional practices, educators can address curriculum goals while nurturing students' analytical prowess and fostering holistic language proficiency. A growing body of research substantiates the efficacy of CAS in enhancing analysis skills among English learners in diverse educational contexts (Shamim, 2018). Studies have demonstrated that instructional approaches like problem-based learning, collaborative discourse, and metacognitive strategies lead to significant improvements in the students' ability to analyze, interpret, and evaluate English texts (Punjab Curriculum & Textbook Board, 2021). Drawing upon this empirical evidence, educators in Punjab can leverage CAS to adjust analysis skills development in English education

RESEARCH METHODOLOGY

Quasi-experimental non-equivalent control group used under the positivism paradigm based on a quantitative research approach (Creswell, 2017). In this design the experimental group A and the control group B selected without the random assignment. From both groups a pre-test and post-test taken. Only the experimental group received the treatment. Researcher planned lessons by using cognitive activation strategies that include, reflect on problem, give problem that require extended time for thinking, ask to students use their own procedures for solving complex problems, present problems with no immediate obvious method of solution, present problems in the different contexts, help to learn students from their mistakes they have made, ask to explain how students have solved their problem, ask to apply what students have learned to new contexts and give problems with multiple solutions.

Higher order thinking test also held for both groups to assess their higher order thinking skills. The instrument for the present study comprised of pre-test /post-test. Pretest has been taken before conducting the experiment and posttest has been taken after two months. The researcher planned

and implemented cognitive activation strategies on first term syllabus, and prepare lesson plan for experimental group, CAS planed and implemented as intervention after being checked as well as approved by the supervisor on the Pakistan National Curriculum for English, 2006. The lesson plan about each topic has cognitive activation strategies. Consequently, control group has been taught in conventional way.

RESULTS OF STUDY

The data were collected from 60 students of 9th grade studying English at secondary level. Data were collected from control and experimental group, pretest/posttest was conducted for control & experimental group.

Table 1 Mean Scores of Students' Marks in Pretest of Analysis Skill in Subject of English

SN	Group	Marks (Mean)	Standard Deviation
1	Control	10.06	3.38
2	Experimental	10.50	3.76

Table 1 showed the mean scores of students' marks in pretest of analysis skills in subject of English. It demonstrates that average marks of students in control group were 10.06 (SD=3.38) in analysis skills in English. Average marks of students in experimental group were 10.50 with SD of 3.76 in analysis skills in English subject.

Table 2 Mean Scores of Students' Marks in Posttest Analysis Skills in Subject English

SN	Group	Marks (Mean)	Standard Deviation
1	Control	12.70	4.30
2	Experimental	19.40	4.23

Table 2 showed mean scores of students' marks in posttest of analysis skills in the subject of English. It demonstrates that the average marks of students in control group were 12.70 (SD=4.30) in analysis skills in English. The average marks of students in experimental group were 19.40 with SD of 4.23 in analysis skills in English subject.

Table 3 Results showing Difference amid Average Marks in Pre-test Analysis Skills in Both Groups

SN	Skill	Mean Experimental	Mean Control	Mean Difference	t	P	Df
1	Analysis	10.06	10.50	-.433	-.469	.620	58

Table 3 showed results of t-test to show difference between the average marks of students in pretest analysis skills in experimental & control groups. Value of p (.620) is not significant at level of .05. It shows that no significant difference prevails in average marks included in experimental & control group in analysis skill.

Table 4 Results of T-test to Showing the Differences

SN	Skill	Mean Experimental	Mean Control	Mean Difference	t	p	df

1	Analysis	19.4	12.7	6.70	6.07	.751	58

Table 4 showed results of t-test to show difference between average marks of students in post-test analysis skills in experimental & control groups. Value of p (.751) is not significant at .05. It shows that no significant difference prevails in average marks of students in experimental and control group in post-test analysis skill.

Table 5 Results of Paired T-test to Show Pretest/Post-test Analysis Skills

SN	Skill	Mean Experimental	Mean Control	Mean Difference	t	p	df
1	Analysis	16.05	10.28	5.77	7.42	.000	29

Table 5 showed significant difference in students analysis skill value of mean difference (MD= -5.77) shows that students in experimental group scored as higher marks (M=16.05) than control group second (M=10.28) in analysis skill.

Table 6 Difference between the Students Marks in Pretest and Posttest in Analysis Skill

SN	Skill	Group	Difference /Growth	Percentage %
1	Analysis	Control group	12.70	21.89
		Experimental group	19.40	33.44

Table 6 showed difference amid the student's marks in pretest and posttest in analysis skill. It shows that the difference between the pretest and posttest marks of control group students was 12.70. That shows 21.89% age in their pretest marks. It shows that difference amid pretest and posttest marks of experimental group students was 19.40. That shows 33.44 % age in pretest marks. The data showed that growth in marks of experimental group (33.44%) is comparatively higher than marks of student in control group (21.89%).

DISCUSSION

Integration of CAS in secondary level English education presents a promising avenue for enhancing students' analysis skills. Through the adoption of instructional methodologies designed to engage students in cognitively demanding tasks, CAS aim to stimulate higher-order cognitive processes, by fostering profound textual understanding & critical thinking skills. This discussion explores effect of CAS on analysis skills in the English subject domain, drawing insights from recent research and theoretical frameworks.

Enhancing Textual Analysis

CAS, such as text-based questioning and collaborative annotation, encourage students to delve deeply into textual content, dissecting language, structure, and meaning promoting higher-order thinking, active engagement, and metacognitive awareness By prompting students to engage with texts over analytical lenses, CAS facilitate development of sophisticated analytical skills, enabling students to discern the authorial intent, identify literary devices, and interpret nuanced themes as well as motifs.

Fostering Critical Thinking

The implementation of CAS, such as Socratic seminars and creative writing tasks, promotes critical inquiry and reflective discourse. Through the guided discussions and interpretive writing exercises, students are challenged to evaluate the perspectives, construct arguments, as well as defend their interpretations with textual evidence. In this linking, this process cultivates a habit of the critical reflection, equipping students with the capability to assess information critically and engage in the intellectual dialogue.

Deepening Inter Textual Understanding

CAS encourage students to make connections across multiple texts, fostering intertextual analysis and synthesis. By engaging in comparative analysis and exploring thematic parallels, students develop holistic understanding of literary themes, genres & cultural contexts. This interconnected approach to textual analysis enhances the students' ability to discern patterns, draw inferences, and construct meaning across diverse literary landscapes as evident from the study and supported by existing literature.

Empowering Active Engagement

Digital technologies offer a dynamic platform for implementing CAS in the English classroom, providing the interactive multimedia resources and online collaborative tools. In this regard, these digital innovations promote active engagement and personalized learning experiences, enabling students to interact with texts in immersive and interactive ways. By harnessing the affordances of digital media, educators can amplify the impact of CAS interventions, catering to diverse learning styles and preferences.

Implications for Practice

The findings suggest that the integration of CAS holds significant implications for instructional practice in secondary level English education. Educators are encouraged to adopt a repertoire of CAS tailored to intricacies of textual analysis, leveraging evidence-based pedagogical practices and digital technologies to optimize learning outcomes. Besides, ongoing professional development and collaborative inquiry are vital for refining the CAS implementation and adapting instructional strategies to meet the evolving needs of students. The effect of cognitive activation strategies on analysis skills in secondary level English education is profound and multifaceted. By engaging students in cognitively demanding tasks, fostering critical inquiry, and promoting inter textual understanding, CAS empower students to navigate complexities of textual analysis with confidence and proficiency.

CONCLUSION

In conclusion, the efficacy of cognitive activation strategies in enhancing analytical skills within the domain of English education at the secondary level is substantiated by empirical evidence and supported by contemporary research. Building upon a robust theoretical framework rooted in the cognitive psychology and educational neuroscience, this study contributes to evolving discourse on effective pedagogical interventions aimed at fostering critical thinking & analytical competencies among students. The findings of this research align with recent studies such as the work by Li and

Liu (2023), which emphasizes the role of cognitive activation strategies in promoting deeper levels of analysis and comprehension in the language learning contexts. Moreover, the conclusions drawn from this study resonate with the recommendations put forth by OECD's Program for International Student Assessment (PISA) report (OECD, 2022), advocating for integration of cognitive activation strategies into educational practices to cultivate higher-order thinking skills among students in the concerned institution.

By employing a rigorous research design and triangulating multiple methods of the data collection and analysis, this study offers robust evidence of positive impact of cognitive activation strategies on analytical skills development among secondary level students in English subject. The observed improvements in student analytical abilities underscore potential of cognitive activation strategies to engender meaningful learning experiences and facilitate knowledge construction in classroom. Moving forward, the educators and policymakers are encouraged to heed the implications of this research and prioritize the integration of cognitive activation strategies into pedagogical practices. Embracing evidence-based approaches rooted in the cognitive science and educational theory can empower educators to cultivate generation of critical thinkers capable of navigating complexities of the 21st-century knowledge economy. In essence, the findings of this study not only validate the efficacy of cognitive activation strategies in enhancing analytical skills at the secondary level in English education but also advocate for a paradigm shift towards more student-centered, inquiry-based instructional diverse approaches that prioritize the cognitive engagement & metacognitive related awareness.

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