IMPACT OF CRITICAL THINKING INTERVENTION ON ACADEMIC SELF-REGULATION IN ENGLISH AT HIGHER SECONDARY LEVEL

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Abstract

This study investigates the influence of critical thinking intervention on students' academic self-regulation in the subject of English at the higher secondary level. The study explored the significance of promoting critical thinking skills and its potential effects on students' ability to regulate their own learning process. True experimental design was used. The experimental group received the instructions using lesson plans based on critical thinking skills in English subject. Researcher made questionnaire of academic self-regulation was used as research tool and 04 null hypotheses were tested. The study used an independent sample t-test and paired sample t-test to analyse the data in SPSS. It was concluded that the integration of critical thinking skills into English subject education can enhance students' academic self-regulation. The study suggests that teachersmust be engage in professional development programs to enhance their own critical thinking skills and pedagogical techniques for teaching critical thinking to students. Educationists should also collaborate with curriculum developers to ensure that curriculum materials and approaches align with the development of critical thinking and self-regulation.

Key Words: *critical thinking, intervention, academic self-regulation, True experimental design*

INTRODUCTION

Education is a dynamic field, constantly evolving to meet the diverse needs of students and society. At its core, education is about equipping individuals with the skills and knowledge required to succeed in their academic pursuits and beyond. One of the fundamental elements that underpin effective learning is the ability to think critically and the capacity to self-regulate one's learning. Critical thinking, a cognitive process that involves analyzing, evaluating, and synthesizing information, is widely recognized as a vital skill in today's knowledge-driven world. Simultaneously, academic self-regulation, encompassing metacognitive awareness, goal setting, and self-monitoring, is integral to students' success in educational endeavours (Pintrich, 2000; Paul & Elder, 2006).

English education at the higher secondary level stands as a cornerstone of a student's academic journey, as it serves not only to develop language proficiency but also to nurture critical thinking skills and self-regulation capacities. A growing body of research emphasizes the pivotal role of critical thinking in educational contexts, suggesting that it can significantly enhance the quality of learning experiences (Ennis, 1987; Halpern, 1998). Similarly, academic self-regulation is viewed as a key determinant of students' academic success (Zimmerman, 2002).However, the specific relationship between critical thinking interventions and academic self-regulation in the context of higher secondary level English education is an area that warrants deeper investigation. While individual studies have explored the impact of critical thinking interventions or self-regulation strategies in isolation, there is a notable gap in the literature regarding their synergistic effects.This study aims to bridge that gap by conducting a systematic analysis of the influence of

critical thinking interventions on the academic self-regulation of students in the context of English education at the higher secondary level. We draw upon existing research on critical thinking (Facione, 2015; Paul, 1993) and academic self-regulation (Boekaerts, 1997; Schunk & Zimmerman, 1998) as foundational elements in our investigation. This study endeavours to shed light on the potential benefits of integrating critical thinking interventions within the curriculum and their role in fostering academic self-regulation among students.

Self-regulation skills are essential for students to effectively manage their learning processes, set goals, and achieve academic success. Self-regulation skills is a set of five components; Planning and goal setting, monitoring and recording, strategies, reflection and self-evaluation. Planning and goal setting involve setting specific, achievable objectives for one's academic tasks and activities. Recent studies have highlighted the importance of goal setting in improving academic performance. For instance, Zimmerman and Kitsantas (2014) discuss the role of setting proximal goals in self-regulation, emphasizing the need for clear and challenging objectives.Monitoring one's progress and recording relevant data is a crucial aspect of self-regulation. Research has shown that self-monitoring strategies, such as keeping diaries or using digital tools, can enhance self-regulation and help students stay on track (Panadero et al., 2017).Self-regulated learners employ a variety of strategies to achieve their academic goals. These strategies can include time management, organization, and metacognitive techniques. Recent studies have explored the effectiveness of these strategies, such as the use of metacognitive self-questioning to improve learning outcomes (Azevedo & Cromley, 2004).Reflection involves critically reviewing one's learning experiences, identifying strengths and weaknesses, and considering how to improve. Research has shown that reflective practices can enhance self-regulation and lead to better academic performance. Karami and Kakanejadifard (2021) discuss the impact of reflective journaling on self-regulation.Self-evaluation involves assessing one's performance and making adjustments based on feedback and self-assessment. Recent research has emphasized the role of self-evaluation in self-regulation. For instance, Dignath and Büttner (2008) discuss the impact of self-evaluation on students' self-regulated learning processes.In summary, self-regulation skills encompass various components such as planning and goal setting, monitoring and recording, employing strategies, engaging in reflection, and self-evaluation. These skills are critical for students to take control of their learning and enhance their academic performance.

In the Pakistani educational landscape, there exists a dual challenge: to impart students with a strong grasp of English language skills and to nurture their ability to think critically and self-regulate their learning. Pakistan's higher secondary education system plays a pivotal role in shaping the future of its youth, equipping them with the necessary skills to meet the demands of an increasingly complex and interconnected world. Within this context, the role of critical thinking interventions in fostering academic self-regulation among students in the subject of English becomes a subject of paramount importance.Pakistan's education system has undergone significant reforms in recent years, emphasizing the need for a more holistic approach to education. The National Curriculum for English, set by the Federal Board of Intermediate and Secondary Education (FBISE) and various provincial educational boards, aims to enhance English language proficiency and comprehension. However, there is a growing recognition that education should encompass not only content mastery but also the development of cognitive skills such as critical thinking (Government of Pakistan, 2006).

Critical thinking, defined as the ability to analyze, evaluate, and synthesize information, has gained recognition as an essential skill in a knowledge-driven world (Rizvi & Saeed, 2019). Additionally, academic self-regulation, encompassing metacognitive awareness, goal setting, and self-monitoring, is fundamental to students' academic success (Nisar, 2016). In the Pakistani context, where English is a medium of instruction in many higher secondary institutions, the development of critical thinking skills and academic self-regulation is crucial.

This study seeks to address a significant gap in the existing literature by examining the effects of critical thinking interventions on academic self-regulation in the context of higher secondary level English education in Pakistan. It aims to provide insights into the potential benefits of integrating

critical thinking interventions within the curriculum and their role in fostering academic self-regulation among Pakistani students.As delving deeper into this study, the researcher aimed to inform educators, curriculum designers, and policymakers about the potential advantages of incorporating critical thinking interventions in English education at the higher secondary level. By doing so, this study will contribute to the improvement of English education in Pakistan and empower students to become more self-regulated, critical thinkers capable of meeting the complex challenges of the modern world. In the Khyber Pakhtunkhwa (KP) province of Pakistan, the higher secondary education system faces a multifaceted challenge: on one hand, there is a pressing need to enhance English language proficiency among students, while on the other, there is a growing recognition of the importance of nurturing critical thinking skills and academic self-regulation. However, the specific relationship between critical thinking interventions and academic self-regulation in the context of higher secondary level English education in KP remains an understudied and under-addressed concern. The province of KP has made notable strides in its educational policies, with a focus on improving English language teaching. Nevertheless, the pedagogical practices that foster critical thinking and self-regulation in this context are still evolving and require comprehensive examination.There is limited empirical research on the impact of critical thinking interventions on academic self-regulation among higher secondary students in KP.It aims to provide a nuanced understanding of how interventions designed to promote critical thinking may be adapted to meet the needs and challenges of the local education system, potentially contributing to the broader goals of educational reform and improved student outcomes in the province.By investigating the intersection of critical thinking intervention and academic self-regulation at higher secondary school level, this study strives to provide practical recommendations for educators, policymakers, and curriculum designers to enhance the quality of English education and empower students to become more self-regulated, critical thinkers in a culturally and educationally relevant manner.

Research Question

Does critical thinking intervention affect students' academic self-regulation in the subject of English at higher secondary level?

Research Hypotheses

$H_{01:}$ there is no significant difference between the mean self-regulation scale (SR) scores of the students in the experimental group and in the control group in English subject before treatment.

$H_{02:}$ there is no significant difference between the mean self-regulation scale (SR) scores in the experimental group and in the control group in English subject after treatment.

$H_{03:}$ there is no significant difference between mean students' self-regulation (SR) scale scores of experimental group in English subject before and after treatment.

$H_{04:}$ there is no significant difference between mean students' self-regulation (SR) of control group in English subject before and after treatment.

RESEARCH METHODOLOGY

A true experimental design is adopted by the researcher. This approach aimed at investigating causal relationships between independent variable (critical thinking intervention) and dependent variable (students' academic self-regulation) through systematic manipulation and control of conditions. In this design, researcher assigned participants to either an experimental group or a control group, allowing them to examine the impact of an independent variable on a dependent variable while keeping other factors constant. This type of design is highly valued in scientific research for its ability to establish cause-and-effect relationships. Random assignment ensures that each participant has an equal chance of being in the experimental or control group. This minimizes selection bias and increases the internal validity of the study (Shadish et al., 2002).The experimental group is exposed to the independent variable (critical thinking intervention) or treatment, representing the cause.The control group is similar to the experimental group but does not receive the treatment. It serves as a baseline for comparison.The dependent variable that is students' academic self-regulation, is the outcome or response that researcher measured to assess

the effects of the independent variable using self-regulation questionnaire. Researcher manipulated the independent variable by applying intervention to the experimental group while keeping the control group under normal or placebo conditions.Controlling extraneous variables and random assignment enhance the internal validity of the experiment, making it more likely that observed effects are due to the independent variable (Campbell & Stanley, 1963). Researcherhas used blinding technique to reduce bias in both the administration of the treatment and the assessment of the dependent variable. Participants of the study were, eighty (80) students of grade-11 in government higher secondary school, of English students. It was ensured that participants were randomly assigned to the control (n=40) and experimental group (n=40) to minimize bias.The control group will not receive any specific critical thinking interventions. They follow the standard curriculum and teaching methods used in the government institutions as lecture method or traditional method.The experimental group received critical thinking intervention. These interventions included specific training, workshops, or materials designed to enhance their critical thinking skills in the context of English education.

The teachers for both groups were previously trained and selected on the basis of purposive sampling technique, having the criteria of minimum five years of teaching experience in English subject at higher secondary school level, with M.Phil. degree in English subject as academic qualification. By keeping the instructors traits same, the researcher reduced the teachers' effect on post-test results.Pre-test was administered under the supervision of researcher herself, to both the control and experimental groups to assess their baseline academic self-regulation skills.Carefully designed lesson plans based on subject matter of grade 11 text book was used for intervention. Activities and exercises that include more of critical thinking (CT) skills was the part of lesson plans (interpretation, analysis, evaluation inference and explanation etc.). Experimental group received an experimental treatment for 12 weeks. A combination of strategies were used to deliver lesson plan after thorough review of literature. CT intervention comprised of following elements:

- Lesson plans based on CT using students' regular text book
- Lesson plans were of three kinds for explicitly teaching CT in EFL classroom
- Lesson plans about teaching poems critically
- Lesson plans about teaching of literature
- Lesson plans about teaching of grammar

Group discussion, peer questioning, debate and problem solving techniques were used to teach the lesson.Post-test was administered to both experimental and control groups, and their results were statistically analysed to assess the effectiveness of CT intervention.

To test the four (4) null hypotheses which were formulated for the study, independent sample t-test and paired sample t-test were conducted using SPSS software quantitatively data was analyzed. The researcher ensured that the research ethics and followed ethical guidelines in conducting the study. The validity and reliability of research questionnaire was established through pilot testing, expert opinion and finding the reliability value of Cronbach alpha which is 0.78, to ensure the accuracy of your findings.A researcher made self-regulation Questionnaire was used in this study to measure the academic self-regulation skills of students towards English subject before and after treatment. The scale consisted of 40 items. After expert opinion of the doctoral committee of education department, the research tool was finalized for data collection (Appendix-A). The questionnaire was comprised of five factors or dimensions having different no. of items: Planning and goal setting (PGS) having 6 items, monitoring and recording (MR) having 6 items, strategies (S) having 12 items, Reflection (R) having 8 items and self-evaluation (SE) having 8 items. Respondents (students) were asked to fill this questionnaire against 4-point Likertscale ranging from strongly disagree to strongly agree. This questionnaire was administered before and after treatment to assess the self-regulation of students in both experimental and control groups.

$H_{01:}$ there is no significant difference between the mean self-regulation scale (SR) scores of the students in the experimental group and in the control group in English subject before treatment.

Table 1 ***Comparison of Students' Self-Regulation (SR) Mean Scores before Treatment***

	Groups	N	Mean	SD Score	SE Mean	t-value	Sig.	Effect Size
SR	Pre-Exp	40	1.02	13.23	1.46	0.449	0.100	1.59
	Pre-Cont	40	1.01	14.58	2.00			
			Not significant					

In Table 1, a comparison is presented between the experimental group in the SR scale (N=40, Mean=1.02, SD Score=13.23, SE Mean=1.46) and the control group in the SR scale before treatment (N=40, Mean=1.01, SD Score=14.58, SE Mean=2.00). The t-test results indicate that the t-value is 0.449, and the p-value is 0.100. The p-value is greater than the significance level of 0.05, which suggests that there is no statistically significant difference in SR scores between the two groups. Therefore, there is no significant difference between the mean SR scores of students in the experimental group (Pre-Exp) and the control group (Pre-Cont) in the English subject before any treatment. Additionally, the effect size (Cohen's D) is 1.59, indicating a relatively large effect size. This suggests that, while the difference in means is not statistically significant, there is a substantial practical difference in SR scores between the two groups. In summary, the analysis suggests that, prior to any treatment or intervention, there is no significant statistical difference between the mean SR scores of students in the experimental group (Pre-Exp) and the control group (Pre-Cont) in the English subject. Hence, $H_{01}$is failed to reject.

$H_{02:}$ there is no significant difference between the mean self-regulation scale (SR) scores in the experimental group and in the control group in English subject after treatment.

Table 2*Comparison of Students' Self-Regulation (SR) Mean Scores after Treatment*

Groups	N	Mean	SD Score	SE Mean	t-value	Sig.	Effect Size
Exp.(Post treatment)	40	2.40	13.27	2.09	13.76	0.018	1.25
Cont. (Post treatment)	40	1.00	12.30	1.94			

In Table 2, a contrast comparison is shown between the mean of post-treatment SR scale of the (Po-Exp) experimental group (N=40, Mean=2.40, SD Score=13.27, SE Mean=2.09) and the (Po-Cont) control group (N=40, Mean=1.00, SD Score=12.03, SE Mean=1.94) in the English subject. A t-test was conducted to assess the difference between these two groups, resulting in a highly significant t-value of 13.76. The associated p-value (Sig.) is 0.018, which is below the conventional significance level of 0.05. This p-value suggests that there is a statistically significant difference in the mean self-regulation scale scores between the experimental group and the control group after the treatment. Furthermore, the effect size, as measured by Cohen's D, is 1.25. This effect size is relatively large, indicating a substantial practical difference in self-regulation scale scores between the two groups. In conclusion, in line with the statistical analysis, $H_{02}$is rejected. The data provides strong evidence that there is a significant difference in the mean self-regulation scale scores between the experimental group (Po-Exp) and the control group (Po-Cont) in the English subject after the treatment. Additionally, the substantial effect size suggests that this difference is not only statistically significant but also practically significant, with meaningful real-world implications.

$H_{03:}$ there is no significant difference between mean students' self-regulation (SR) scale scores of experimental group in English subject before and after treatment.

Table 3*Comparisons of Students' Experimental Groupin SR Scores before and after Treatment*

Test	N	Mean	SD	SE Mean	Correlation (p)	Paired Difference			t (p)
						M	SD	SEM	

Pre	40	1.02	9.23	1.46	0.34	3.73	15.9	2.51	14.82
Post	40	2.40	16.27	2.09	(0.036)				(0.000)

Table 3 shows that students mean SR scale of experimental group in pre- test (N=40, Mean=1.02, SD Score=9.23, SE Mean= 1.46) and in post-test (N=40, Mean= 2.40, SD Score =16.27, SE Mean=2.09). The value of correlation (r=0.34) p=0.036 <0.05 also showed significant relationship between post and pre SR scale scores. Paired differences of post-test and pre-test Mean=3.75, SD=15.9, SE Mean=2.51. The difference of SR scale score between pre-test and post-test of experimental group is statistically significant as t-value=14.82, p=0.000 < 0.05. This information indicating strong evidence against the null hypothesis H_{03}. In other words, there is a significant difference between the mean SR scales of the experimental group before and after the treatment. This suggests that the treatment had a significant impact on the students' SR scale scores in the context of English subject.

$H_{04:}$ there is no significant difference between mean students' self-regulation (SR) of control group in English subject before and after treatment.

Table 4 ***Comparisons of Students' Control Groupin SR Scores before and after Treatment***

Test	N	Mean	SD	SE Mean	Correlation (p)	Paired Difference			t (p)
						M	SD	SEM	
Pre	40	1.01	14.5	2.30	0.942	0.875	5.10	0.807	1.084
Post	40	1.00	12.3	1.94	(0.000)				(0.285)

Table 4 shows that SR scale scores of control group in pre- test (N=40, Mean=1.01, SD Score=14.5, SE Mean=2.30) and in post-test (N=40, Mean=1.00, SD Score=12.3, SE Mean=1.94). The value of correlation (r=-0.942), p=0.000 < 0.05 also showed very significant relationship between post and pre-SR scale scores. Paired differences of post-test and pre-test Mean=0.875, SD=5.10, SE Mean=0.807. The difference of SR scale scores between pre-test and post-test is not statistically significant as t-value=1.084 and p=0.285 > 0.05. Based on the results, the paired t-test produced a t-value of 1.084 with a p-value of 0.285 for the comparison of SR scores before and after treatment in the control group. The p-value is relatively high (greater than the commonly used significance level of 0.05), indicating that there is no significant difference between the mean SR scores before and after the treatment in the control group for the English subject. Therefore, based on the analysis, it can be concluded that there is no significant evidence to reject the null hypothesis H_{04}, suggesting that the treatment did not have a significant effect on the self-regulation scores of the control group in the English subject.

DISCUSSION

The findings of the study implies that the pre-test was successful in equating the students and dividing them into experimental and control groups as shown in Table no. 1. These findings are consistent with Ramdass and Zimmerman (2011); Fatima (2021) study on developing self-regulation skills. Furthermore, the implementation of the critical thinking skills intervention has positive significant effect self-regulation as shown in the table no.2, by comparing the mean scores of experimental and control group after treatment. Andrade (2019) has shown similar results to the present research study. It is worth noting that CT intervention of the experimental group increased mean scores of students' self-regulation in English by comparing pre-test and post-test scores of experimental group as shown in table no. 3, providing a flexible platform for students to develop higher order thinking skills and self-regulation abilities. Additionally, previous research by Rashid (2019) and Nold (2017) revealed a notable shift in students' critical thinking abilities, progressing from a weak level to a strong one by the conclusion of the intervention, thereby affirming the success of the intervention. The observed significant improvement in critical thinking attitudes provided compelling evidence of the effectiveness of the intervention. While the comparison of

mean scores of control groups before and after treatment, in self-regulation (SR) showed no significant difference as control group didn't receive any CT intervention or treatment as shown in table no. 4. It was confirmed from the findings that the improvement in students' self-regulation abilities was happened in experimental group due to CT intervention. This divergence in outcomes between the experimental and control groups further underscored the specific and influential role of the CT intervention in driving improvements in academic achievement and self-regulation. These results also supported by a previous study by Masud (2022), his findings indicate noteworthy distinctions in the academic self-regulated learning strategies employed by high and low achievers. Hashamdar and Maleki (2018) also investigated the effects of the instruction of self-regulation strategies and critical thinking strategies on the second language vocabulary achievement among Iranian English as a Foreign Language (EFL) learners. Phan (2010) also suggested in the previous research study that critical thinking acts as another cognitive strategy of self-regulation that learners use in their learning, and critical thinking may be a product of various antecedents such as different self-regulatory strategies. In a recent study, Mohammadi et al. (2023), conducted an explanatory mixed methods study and investigated the interrelationships among self-regulated learning (SRL) components, critical thinking and reading comprehension. The results of the quantitative analyses of measurement and structural models indicated thatcognitive strategies and metacognitive strategies significantly and directly affected critical thinking and reading comprehension. While the qualitative findings of the study approved the predictive relationships of Self-Regulated learning components with reading comprehension and critical thinking. Although several previous studies confirms the results of this current research study, regarding the positive significant impact of self-regulation on academic achievement (Ho, 2004; Zimmerman, 2013; Mega et al., 2014; Ergen &Kanadli, 2017; Khan, 2020; Zheng et al., 2021). It was also concluded from the above discussion that self-regulation abilities directly affect students' academic achievement positively as by improving their planning and goal setting, monitoring and recording, strategies, reflections andself-evaluation and all other components or dimensions of academic self-regulation of students in English.

CONCLUSION AND RECOMMENDATIONS

It was concluded that critical thinking skills have a significant impact on students' academic self-regulation in English subject, provides valuable insights for policy makers, teachers, educationists and researchers. Policy Makers shouldencourage the integration of critical thinking skills development into the official curriculum. This can be done by setting guidelines and standards for incorporating critical thinking across subjects, including English. Allocate resources for teacher training and development programs focused on fostering critical thinking skills in students. Invest in educational materials and resources that support critical thinking instruction. Promote the development of assessments that evaluate critical thinking skills as an integral part of the educational system. Align assessment methods with the desired outcomes related to self-regulation and critical thinking.Teachersmust be engage in professional development programs to enhance their own critical thinking skills and pedagogical techniques for teaching critical thinking to students.Integrate critical thinking activities, such as problem-solving tasks, discussions, and argumentation, into their English subject lessons.Foster a classroom environment that encourages students to think critically and take responsibility for their own learning, thereby promoting self-regulation. Educationists should conduct research to identify and disseminate best practices in teaching critical thinking skills and improving self-regulation in English subject classrooms.Collaborate with curriculum developers to ensure that curriculum materials and approaches align with the development of critical thinking and self-regulation.

FURTHER INVESTIGATION

Continue research on the specific mechanisms through which critical thinking skills influence self-regulation in English subjects. This can help in understanding the nuances of this relationship and inform targeted interventions. Conduct longitudinal studies to assess the long-term impact of

critical thinking instruction on students' self-regulation and academic success in English subjects.Disseminate research findings through publications and conferences to keep educators and policy makers informed about the benefits of critical thinking for self-regulation in English education.So, the integration of critical thinking skills into English subject education can enhance students' academic self-regulation. To realize these benefits, policy makers, teachers, educationists, and researchers should work collaboratively to promote critical thinking education, provide the necessary resources, and continually improve pedagogical practices to foster these valuable skills in students.

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