THE IMPACT OF WCR CREATIVE THINKING SKILLS ON COGNITIVE LEARNING OUTCOMES OF JUNIOR HIGH SCHOOL STUDENTS

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Abstract

This study investigates the impact of creative thinking skills, specifically through the Widening, Connecting, and Reorganizing (WCR) model, on the cognitive learning outcomes of junior high school students at SMPK Sint Vianney Soe. Creative thinking is acknowledged as a pivotal 21st-century competency that not only empowers students to devise innovative solutions but also influences their learning achievements. Nonetheless, the relationship between creative thinking skills, particularly the WCR model, and cognitive learning outcomes remains underexplored. This research addresses this gap using a descriptive-correlational design, collecting data from 55 students through validated instruments. The findings reveal a significant relationship between creative thinking skills and cognitive learning outcomes, as evidenced by the regression equation Y=26.354+0.691X. Creative thinking skills account for 69.7% of the variance in cognitive learning outcomes. Among the WCR dimensions, the widening aspect demonstrates the most robust correlation with cognitive outcomes, followed by the connecting aspect, while the reorganizing aspect shows no significant relationship.

Keywords: *creative thinking, WCR model, cognitive learning outcomes.*

1. INTRODUCTION

Creative thinking skills, recognized as pivotal 21st-century competencies, are gaining substantial traction within the educational sphere. These skills empower students to devise innovative solutions to a myriad of challenges and profoundly influence their academic achievements.

In the process of learning and assimilating information, students must engage in higher-order mental processes, collectively referred to as thinking. Thinking encompasses the manipulation of data, facts, and information to formulate behavioral decisions (Tawil and Liliasari, 2013). Students proficient in thinking exhibit scientific literacy, comprehend academic content, and harness information effectively. They also demonstrate creativity as a key outcome of this cognitive skillset (Rindel, 1999).

Extensive research has explored the relationship between creative thinking skills and students' conceptual understanding. Prior studies (Muliyani and Kurniawan, 2014; Nuriadin and Perbowo, 2013; Laughlin, 1967; Walkup, 1965) have identified a positive correlation between creative thinking and students' cognitive learning outcomes. Mastery of creative thinking enables students to independently construct and refine their understanding of phenomena, resulting in accurate concepts stored within their cognitive structures. In other words, creative thinking aids in the assimilation and integration of knowledge.

The approach to measuring creative thinking skills employed in the aforementioned study, and commonly utilized in contemporary research, encompasses dimensions of fluency, flexibility, originality, and elaboration. Meanwhile, this study adopts an alternative approach by applying the Widening, Connecting, and Reorganizing (WCR) model, which offers a distinct perspective on the mental processes involved in creative thinking.

The WCR model, proposed by Antonietti, et al. (2011), posits that creative thinking encompasses three mental

operations: widening, connecting, and reorganizing. Widening refers to the ability to remain open-minded and aware of a vast number of elements identifiable in a given situation. This aspect is characterized by students' ability to generate a variety of ideas (Pizzingrilli et al., 2015; Cardarello, 2014). Connecting involves the ability to create combinations among different ideas, establish reciprocal relationships between diverse elements, draw analogies, amalgamate ideas in unconventional ways, or synthesize a diversity of elements into a cohesive structure. Reorganizing entails the ability to capture and restructure new properties of a particular situation. This is evidenced by students' ability to shift perspectives, view information from different angles, or envision potential scenarios in unconventional circumstances.

The WCR model aligns with the perspectives of several scholars. Munandar (1999) posits that creative thinking is the capacity to discover numerous potential solutions to a problem based on the available data or information. Evans (1991) characterizes creative thinking as the ability to unveil new relationships, view a subject from an alternative perspective, and synthesize new combinations of two or more known concepts. Goodwin and Sommervold (2012) assert that creative thinking entails the ability to discover or repurpose something to create a novel entity with intrinsic value. Collectively, these viewpoints indicate that creative thinking skills are associated with the capability to generate diverse ideas from a stimulus, associate various ideas, and restructure a concept.

Despite these theoretical insights, no research has yet investigated the relationship between WCR model of creative thinking skills and students' cognitive learning outcomes. Consequently, this study aims to explore the influence of WCR-based creative thinking skills on cognitive learning outcomes, with the research subjects being students at SMPK Sint Vianney Soe.

2. RESEARCH METHOD

This research employs a descriptive-correlational design to analyze the impact of WCR-model creative thinking skills on students' cognitive learning outcomes. The research sample consists of 55 students from SMPK Sint Vianney Soe.

A creative thinking skills test was used to measure students' creative thinking skills. This instrument was developed in the form of essay questions with indicators derived from WCR aspects of creative thinking (Antonietti et al., 2011): *widening*: (1) awareness of multiple elements identifiable in a given situation; *connecting*: (2) establishing reciprocal relationships among different elements, (3) drawing analogies between disparate entities, (4) synthesizing diversity from various elements into a cohesive structure; *reorganizing*: (5) shifting perspectives or assuming different viewpoints, and (6) envisioning potential outcomes if an atypical condition arises. The instrument comprises 12 validated questions, with a reliability coefficient of 0.961.

To assess cognitive learning outcomes, a multiple-choice test with four options was utilized. The questions covered topics on light and the human visual process and were designed to target cognitive levels C1 to C4. This instrument consists of 29 validated items, with a reliability coefficient of 0.866.

For data analysis, correlation tests and simple linear regression analysis were performed to evaluate the relationship between creative thinking skills and cognitive learning outcomes. The significance of this relationship was ascertained through ANOVA tests, with a significance threshold set at 0.05.

3. RESULT AND DISCUSSION

The statistical test results to identify the significance of the influence of creative thinking skills on students' learning outcomes were presented in Table 1. Data showed the results $F(1,53) = 121.781$, p-value < 0.05, indicating a significant influence of creative thinking skills on students' cognitive learning outcomes.

The extent of the impact of the creative thinking skills variable on students' cognitive learning outcomes was determined using the coefficient of determination (R Square) as shown in Table 2. The data revealed an R Square value of 0.697 indicating that 69.7% of the variance in students' cognitive learning outcomes is explained by their creative thinking skills.

Table 1. ANOVA Test Output

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1613.787	1	1613.787	121.781	0.000[b]
Residual	702.330	53	13.252		
Total	2316.117	54			

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.835[a]	0.697	0.691	3.64026

Tabel 3. Coefficients Output

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	26.354	4.626		5.697	0.000
Creative thinking skills	0.691	0.063	0.835	11.035	0.000

This implies that 69.7% of the cognitive learning outcomes were influenced by creative thinking skills, while the remaining 30.3% were influenced by other factors.

Moreover, Table 3 presents a constant value (a) of 26.354 and a regression coefficient (b) of 0.691, suggesting that creative thinking skills influence students' cognitive learning outcomes through the regression equation Y=26.354+0.691X. This indicates that each additional score in creative thinking skills is associated with an increase of 0.691 in cognitive learning outcomes.

Table 3 further elucidates the t-test, where a significance value of 0.000 was obtained, which is less than 0.05, thereby confirming that the regression coefficient possesses statistical significance.

Creative thinking skills significantly influenced cognitive learning outcomes because students with strong creative thinking abilities were better able to generate their own conceptions of phenomena, transforming them into accurate concepts and storing them in their cognitive structures. This was consistent with Laughlin's (1967) findings, which indicated a positive correlation between creative thinking ability and concept formation. Students with higher creative thinking skills were better at forming incidental concepts related to a subject than those with lower creative thinking abilities.

The relationship between each aspect of creative thinking skills and cognitive learning outcomes can be visualized in the following diagrams.

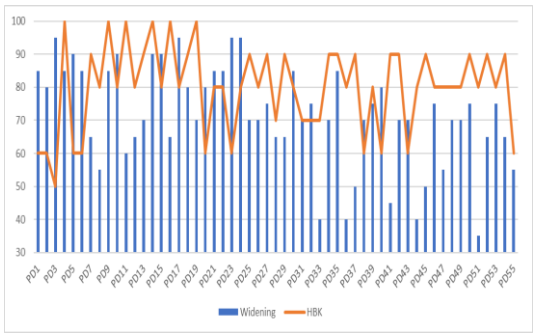

Figure 1. Analysis of the Widening Aspect in Relation to Cognitive Learning Outcomes

Figure 1 demonstrates that an escalation in the aspect of widening is associated with enhancements in cognitive learning outcomes. The correlation coefficient of 0.63 signifies a moderately robust positive association between the two variables. This implies that the increased capacity to elaborate on ideas correlates with elevated cognitive learning outcomes.

The capacity of students to discern various elements within a given context, such as formulating diverse concepts regarding the phenomenon of light, substantially augments their comprehension. Educational strategies that promote the cultivation of this dimension,

including brainstorming, eliciting prior knowledge, and investigating authentic phenomena, can assist students in constructing a more expansive cognitive framework.

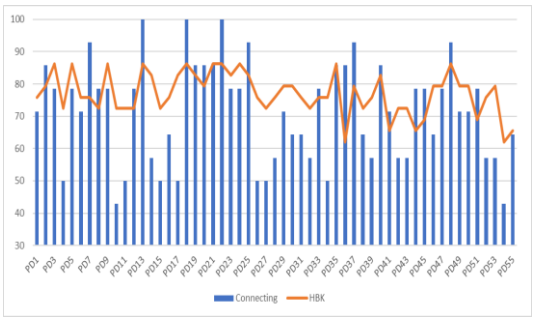

Figure 2. Analysis of the Connecting Aspect in Relation to Cognitive Learning Outcomes

For the connecting aspect in Figure 2, an increase in the connecting aspect was associated with an improvement in cognitive learning outcomes, though the trend was less pronounced than in the widening aspect. The correlation value of 0.47 indicated a positive relationship, suggesting that the ability to connect ideas contributed to cognitive learning outcomes, but not as strongly as widening.

In this case, students' proficiency in relating a concept to other disciplines, fostered an interdisciplinary understanding that enriched their cognitive insights. For instance, the analogy between a camera and the structure of the human eye strengthened the connections between concepts.

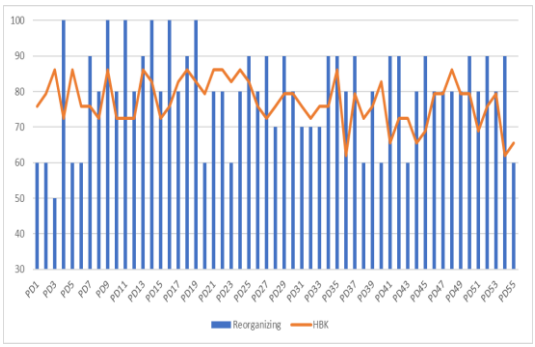

Figure 3. Analysis of the Reorganizing Aspect in Relation to Cognitive Learning Outcomes

The reorganizing aspect exhibited a different pattern. Students with low scores in this aspect actually showed higher learning outcomes compared to those in other categories. This suggests that the relationship between reorganizing and cognitive learning outcomes was non-linear. The correlation value of -0.02 indicated a very weak or almost nonexistent relationship, implying that the ability to reorganize ideas was not significantly related to cognitive learning outcomes.

It was noteworthy that this study employed cognitive learning outcome tests spanning the C1 to C4 domains. Consequently, further investigation is needed to fully assess the impact of creative thinking skills, particularly the reorganizing aspect, on cognitive learning outcomes across a broader range of cognitive levels.

4. CONCLUSION

The present findings substantiated that creative thinking skills exerted a considerable influence on the cognitive learning outcomes of students at SMPK Sint Vianney Soe, where 69.7% of the variance in cognitive learning outcomes was elucidated by creative thinking skills, as represented by the regression equation Y=26,354+0,691X. The residual 30,3% was attributed to alternative factors. Furthermore, the study indicated that the widening aspect exhibited the most robust correlation with learning outcomes, succeeded by the connecting aspect, whereas the reorganizing aspect demonstrated no significant association.

These findings highlight the importance of fostering creative thinking in educational settings. Educators can improve students' cognitive outcomes by devising instructional activities that foster widening aspect, which encourages the exploration of diverse ideas, and promote connecting aspect, which facilitates the synthesis of ideas across disciplines. Furthermore, professional development initiatives for educators may incorporate training on the implementation of the WCR model to advance creative thinking within classroom settings.

By leveraging these insights, educators and educational system can proficiently cultivate creative thinking, thereby enhancing students' academic performance and preparedness for forthcoming challenges.

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