Comparison of Brain Targeted Teaching Model V/S Students' Content Schemata with Online Instruction in Reading to Students Different Motivation Level

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Abstract. The purpose of this research is to study the effects of brain targeted teaching (BTT) model v/s activating students' content schemata v/s in online to teach reading comprehension to students with different motivation level in one of private college in Indonesia. The participants of this research were students who were taking Critical Reading class. Class A was as the experiment class 1 and class B was as experiment class two. Every class consisted of 30 students (15 high and 15 low motivation level). This study was experimental research design by using 2 x2 factorial designs. The data collection was done by give questionnaire reading motivation level and reading comprehension test. The data was analyzed by ANOVA. The study revealed results that the BTT model and activating student content schemata were effective to teach reading comprehension to high and low students' motivation level. BTT model gave better effect than activating students' content schemata with high and low motivation level. The last there was an interaction between teaching techniques, students' critical reading achievement and motivation level. In conclusion, both BTT model and activating students' content schemata were effective applied in teaching reading achievement to students with high and low motivation level.

Keywords: brain targeted teaching model, students' content schemata, students' achievement, students reading motivation level.

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INTRODUCTION

Some recent studies regard to the brain based learning and teaching have emerged recent a few years. Those findings give some insights to help educators create even better classroom environments to make more effective teaching and learning process. It is found that knowing how the brain works and learns can be advantageous for educators and of course it can be beneficial for the learners.

During the Covid 19 Pandemic, educators face a wide range of challenges. The outbreak of Corona Virus 19 pandemic forces all education environment performs fully online learning (Moorhouse, 2020). Students and educators must have a full class in the virtual classroom. Educators are unable to meet with their students face-to-face because of the distance learning process. Distractions in the teaching and learning process can be generated by a number of circumstances. Students often feel frustrated when they have fully online learning.

The most pressing issue in our educational system these days is to what extent the teaching strategies, methods, and approaches used may improve students' motivation and accomplishment in Pandemic era. Because of the outbreak of the Corona virus 19 pandemic, the leading key external stimulus will be used to prepare students for learning in fully online classes, which are appropriate to the levels of the students in the activities to be applied for attaining the predetermined achievements.

Reading an English text is a difficult and time-consuming activity. It motivates them to learn English, particularly reading. Bin-Tahir (2012) agreed, claiming that most students lacked vocabulary mastery, making it difficult for them to read English texts. Educators were the most influential in motivating them to study of ESL As a result, lecturers are one of the most important factors influencing students' English learning by communicating, teaching, and using appropriate teaching materials and educators of ESL should promote all types of motivation in the classroom and guide students towards achieving goals (Azar &Tanggraju , 2020 ; Azar & Sahar, 2021). This study found that L2 readers had both internal and extrinsic motives, based on the motivation reading questionnaire (MRQ). Aside from that, based on the results of the investigation, it appears that the intrinsic-extrinsic reading motivational purposed by (Wang and Guthrie 2004; Hoffman, 2012; Sikora 2013).

It also happens in teaching English language teaching in Indonesia. Teaching English as a

foreign language especially in critical reading course is challenging for educators. It has been revealed in EFL reading that many students regard reading as an uninteresting activity (Kweldju, 1996; Rukmini, 2004). Kweldju (1996) found that students were uninterested in reading their content area textbooks, despite believing that they were useful. She stated that the students' lack of interest was due to a lack of background knowledge, an inability to understand the text's content, and the text's complicated organizational structure.

According to Kaufman et al. (2008) and Jensen (2007) meaningful learning occurs when it is Implemented to prefer a educator-centered to a learner-centered environment involving. In a learner-centered setting, educators must increase students' understanding of course content by creating a rich fully online classroom environment in the outbreak of Corona virus 19 pandemic that includes physical, emotional, and social dimensions (Jensen, 2007). The emotional foundation is at the soul of the learning process (Parr, 2016), and Salem (2017).

The Brain-Based Teaching Approach (BBTA) is one of the types of learner-centered teaching strategies that makes use of students' cognitive abilities and psychology (Caine & Caine, 2002 and Hardiman, 2012; Dubinsky, Roehrig, & Varma, 2013; Hoffman, 2012; Sikora 2013). When it came to extrinsic motivation, the students mostly agreed that they were influenced by those around them. Educators were the most influential in motivating them to learn English. As a result, lecturers are one of the most important factors influencing students' English learning by communicating, teaching, and using appropriate teaching materials (Azar & Sahar, 2021). It is obvious that educators must explore new with various teaching methods and discover how courses can be taught effectively.

To respond this requirement**,** educators should consider how the brain learns a new language.

According to Conboy (2013), a better understanding of the brain's language acquisition of second language on brain function improves and informs the best methods in education by engaging foreign language learners. According to Howard-Jones (2010), Some experts and instructors are becoming more aware of the benefits of neuroscience in terms of the brain and its function when students learn as neuroscientific knowledge grows. The advancement of neuroscientific knowledge has led to an increase in brain-based education. Unlike previous beliefs that learning only involves the superior part of the human body, the brain-based teaching approach maintains that learning involves the entire human brain structure (R. N. Caine & G. Caine,1991, 2002; Jensen, 2007 & Tang, 2017).

The brain targeted teaching model with online instruction has been employed in teaching critical reading. Although all teaching and learning processes in Corona Virus 19 pandemic must be conducted in fully online class, but educators should not ignore the students' engagement, emotion, comfort and motivation in learning process. According to some studies, a brain-based learning approach assists educators in determining how they should teach their students Rukminingsih, et al., (2021); Rukminingsih (2018), Parr (2016), Hardiman (2012) and Sabitzer, (2011); Srikoon et al., 2017; Retone & Maricar, (2020). While according to Rukminingsih (2018, 2021) and Sabitzer, (2011) , the implementation of brain based teaching and learning can be more effective if it is supported by technology instructions.

Students will learn better if learning is "authentic," because it deals with real-world problems and presentations (R. N. Caine & G. Caine, 1990, 1994; Sousa, 1995, 1998; Jensen, 1998). Garca, et al. (2014) It was also discovered that certain learning processes, such as inferencing and combining prior knowledge with text information while reading, are required to comprehend the text. Theory of schema is basically a theory of background knowledge. According to this theory, schemata or background knowledge are used to make sense of a reading text(Rumelhart, 1980; Fahriany, 2014).

An (2013) differentiates three types of schemata: linguistic, formal, and content schemata, all of which are related to reading comprehension. Linguistic schemata are a reader's vocabulary, grammar, and jargon knowledge. It may be impossible to decode and understand the text without it. As a result, readers will use formal schemata to represent the text schematically. Formal schemata are the organizational forms and rhetorical structures of written texts that readers will use to represent the text schematically. Finally, content schemata refer to the content area's background knowledge. Prior expertise in a field, cultural understanding, and familiarity with a topic are examples of this (An, 2013).

The concept of schema was first proposed by Bartlett. Carrell and Eister hold then classified the schema into several types. One of them is Content

Schemata, which is background knowledge of a text's content area or topic. They include familiarity with a topic, cultural knowledge, and prior experience in a field. Content schemata deal with knowledge related to the text's content domain, which is essential for understanding texts.

Prior knowledge can be obtained by activating students' content schemata. According to Rumelhart, (1980); Zhao and Zhu (2012) content schemata refer to the background knowledge of a text's subject matter. The students are familiarity with a topic, cultural understanding, and prior expertise in a certain field. Content schemata deal with knowledge about the text's content. Schemata, according to a number of studies, play an important role in reading comprehension and provide a better understanding of the subjects of texts (Huang, 2019; McNeil, 2011; Salbego & Osborne, 2016; Cho & Ma, 2020). As a result, while the schema theory guides students to improve their sensory thinking to imaginative thinking so that they can be active in their process of reading, guessing, and positively confirming the text, it ignores vocabulary and basic language features.

Some scholars have recently conducted studies on brain-based teaching; however, there have been few studies on brain-based teaching integrated with online instruction. Some researchers frequently focus on the implementation of brain-based teaching and learning in the classroom, which does not apply to virtual classes (Srikoon et al., 2017; Srikoon et al., 2017; Retone & Maricar, 2020; Gozuyesil, 2014; Rukminingsih, 2018, 2021). Thus, the goal of this study is to fill gaps in previous research by comparison between brain targeted teaching modal and activating students schemata with online instruction by using high and low reading motivation level as the moderator variable.

Therefore, the purpose of this study is to investigate the comparison of brain targeted teaching model v/s students' content schemata with online instruction in reading to students' different motivation level that could support students' achievement in critical reading course. Moreover, educators can improve and motivate students during full online learning, especially in terms of critical reading courses. The research questions of the study are the following :

1. Is there distinct impact between brain targeted teaching model v/s students' content schemata with online instruction in reading to students' different motivation level in students' achievement in EFL critical reading course?
2. Do the achievements of students with high motivation in the EFL reading course get higher than those with low motivation?
3. Is there an interaction between teaching strategies and the level of students' motivation in students' achievement in EFL critical reading course?

METHOD

Research Goal.

This study was quasi experimental research design with a 2x2 factorial design. This study aims to is to assess the effects of activating students' content schemata v/s brain targeted teaching (BTT) model in online to teach reading comprehension to students with different motivation level in English language Education department of STKIP PGRI Jombang.

Sample and Data Collection

This study was conducted in a private college in East Java Province, Indonesia. Sixty undergraduate students majoring in English education department were selected for the research sample through a purposive sampling technique. The participants of this research was students who were taking Critical Reading class. Class A was as the experiment class 1 and class B was as experiment class two. Every class consisted of 30 students (15 high and 15 low motivation level). They were taking critical reading course in the fifth semester. The students were assigned in two groups, namely the experimental group taught by brain based targeted teaching model with online instruction and the control group by activating students' content schemata with online instruction, and moderator variables (high and low motivation).

The research design was presented on Table 1. In doing the research internal and external validity were controlled as good as possible.

Table 1. Factorial research design 2x2

Teaching Strategy (A)	Brain targeted teaching model with online instruction (A1)	Activating students' content schemata with online instruction (A2)
Students' Motivation (B)	As an experimental class	As a control group
High (B1)	A1 B1	A2B1
Low (B2)	A1 B2	A2 B2

Note :

A1B1: Students who have high motivation are taught by using online instruction Brain Targeted Teaching model with online instruction

A2B1: Students who have high motivation are taught by activating students' content schemata with online instruction

A1B2: Students who have low motivation are taught by online instruction Brain Targeted Teaching model with online instruction

A2B2 :Students who have low motivation are taught by activating students' content schemata with online instruction

The data collection was taken by using students' reading motivation questionnaire and reading comprehension test. The questionnaire was used to measure students' reading motivation level to classify students into high and low levels of reading motivation. The questionnaire with Likert scale in which the questionnaire was designed with related indicators of students' reading motivation. Reading comprehension test was used to assess students' achievement in EFL reading comprehension.

Data Analysis

Students' proficiency in EFL reading comprehension was assessed using a reading comprehension test. This study used a two-way Analysis of Variance (ANOVA) with a significance level of alpha = 0.05. To test the three hypotheses, it was utilized. The normality and homogeneity of the test were two assumptions that had to be met for the two-way ANOVA. The Lilliefors test was used to determine normality, while the F and Barlet tests were used to determine homogeneity.

RESULTS AND DISCUSSION

The results showed in two sections to answer the research questions. First, the summary of data description is presented in table 1 and the second, Summary on calculation result of two -way ANOVA data is presented in table 2.

Table 1. Summary of data description

Statistical Values	A1	A2	B1	B2	A1B1	A1B2	A2B1	A2B2
N	30	30	30	30	15	15	15	15
Highest score	37	34	93	71	37	29	33	29
Lowest score	20	20	20	20	20	20	20	20
Mean	28.08	26.89	81.63	63.68	31.63	24.58	26.58	25.58
Median	28.00	27.50	80.00	64.50	31.00	25.00	26.00	26.00
Mode	28.00	28.00	76.00	64.00	30.00	27.00	32.00	29.00
Standard deviation	4.54	4.09	5.62	4.39	2.73	3.06	4.35	3.06
Variance	20.57	16.69	31.59	19.25	7.47	9.37	18.92	7.37

Notes:

A1 : group of students taught by using brain – targeted teaching model with online instruction

A2 : group of students taught by activating students' content schemata with online instruction

B1 : group of students with high motivation

B2 : group of students with low motivation

A1B1 : Students who have high motivation are taught by using online instruction Brain Targeted Teaching model with online instruction

A2B1: Students who have high motivation are taught by activating students' content schemata with online instruction

A1B2: Students who have low motivation are taught by online instruction Brain Targeted Teaching model with online instruction.

A2B2: Students who have low motivation are taught by activating students' content schemata with online instruction.

The following is a summary of the two-way ANOVA computation, which included variance related to the mean score, teaching strategies, student motivation, interaction, error, and treatment method. Looking at this description of the analysis of variance, it is easier to consider the analysis related to two-way ANOVA, as shown below.

Table 2. Summary on Calculation Result of Two Way ANOVA

Variance	Dk (Df)	Sum of squares	Mean square	F observed	Ft A (α)=0.05
Teaching strategies	1	308	308	28.12	3.88
Students' motivation	1	78	78	7.82	3.88
Interaction	1	174	174	15.22	3.88
Error	72	812	11.27	-	-
Means of treatment	1	557155	-	-	-
Total	76	57155	-	-	-

This description of the two-way ANOVA measurement results was used to validate or identify the research hypotheses. The table above described the result of the testing hypothesis. Based on the data on the table above, it was concluded that the alternative hypotheses were confirmed.

The value of observed F exceeds the value of F from table in the three variances (teaching strategy (28.12), motivation (7.82), and interaction (15.22) whereas the value of F from table was merely 3.88 for three variances. It could be seen that the three hypotheses were confirmed at alpha 0.05, as the first hypothesis is that the students' achievement in reading comprehension taught by using brain targeted teaching model with online instruction was higher than those taught by activating students' content schemata was confirmed; the second hypothesis is the students' motivation in the critical reading course with high motivation were higher than those with low motivation was confirmed; the third hypothesis is that There was interaction between teaching techniques, students' achievement in critical reading course and the level of students' motivation in EFL reading achievement was confirmed.

According to the results of the study, the BTT model and activating student content schemata was effective in teaching reading comprehension to students with high and low motivation levels. Based on the results, it described that students' achievement in critical reading course by employing brain targeted teaching model with online instruction. The conceptual understanding of implementing brain based targeted teaching model with online instruction has been proved that there is a great increase. Rukminingsih, et al., (2021); Rukminingsih (2018), and Sabitzer, (2011) stated that Brain based teaching and learning strategies with online instruction can create an online positive atmosphere, stimulate students' engagement and motivation. (Parr, 2016), and Salem (2017) stated that brain based targeted teaching model stimulate positive emotion, The techniques of brain targeted teaching model with supporting technology are involving (1) Creating positive emotional learning climate on synchronous learning, (2) Introducing using multiple modalities and technologies, (3) Employing critical thinking to critical reading both synchronous and asynchronous. (4) Giving feedback both synchronous and asynchronous. which adapted from (Caine & Caine, 2016; Sausa, 2001 and Parr, 2016, Rukminingsih, et al., 2021). Rukminingsih (2018) & Hardiman, (2012) found that educators should make use of brain based teaching strategy and the concept of brain based learning in the classroom by using various online platforms, such as in Google classrooms, Zoom, and Telegram, educators can use feedback loops to find out whether the students' perception matches their expectation. This step is used to organize information in the brain at different motivation levels.

Students must transform information as their own learning with the use of working memory and prior knowledge to form long-term allow students to use the information into different products that can become a trigger for conceptual understanding. Conboy, 2013; Tang, 2017 .and Rukminingsih (2018) found that educators should make use of brain based teaching strategy and the concept of brain based learning in the classroom.

While activating students content schemata with online instruction is one of the teaching techniques. The students' reading achievement improved significantly as a result of the Schema activation strategy, as the students were eager to learn about the text's contents. During the treatment, the researcher provided some methods to the students. The researcher demonstrated some reading techniques to the students. They were taught how to quickly find the main idea and supporting details, as well as how to learn new vocabulary. While activating students' content schemata with online instruction while was implemented by using various online platforms, such as, via Zoom, Telegram and Google classroom. Teaching technique by activating students' content schemata with online instruction involving (1) giving similar topic with the text which will be discussed in online class the

day before, (2) asking students to develop their background knowledge by searching and reading the similar topic, (3) discussing with students by evaluating the text both synchronous and asynchronous, (4) Giving feedback both synchronous and asynchronous. Based on the results of data analysis on this study, activating students' content schemata with online instruction is less effective than the use of Brain targeted teaching model with online instruction. It is similar with the theories and previous studies about content schemata. According to a number of studies, play an important role in reading comprehension and provide a better understanding of the subjects of texts (Huang, 2019; McNeil, 2011; Salbego & Osborne, 2016; Cho & Ma, 2020). Based on these previous studies, the results of our study is contradiction with these previous studies while it was compared to the brain based targeted teaching model with online instruction, the activating student content schemata was less effective than brain targeted teaching model with online instruction.

Based on the finding of second research question showed that the achievements of students with high motivation in the EFL reading course get higher than those with low motivation. It is supported by some previous studies (Azar &Tanggraju , 2020; Azar & Sahar, 2021; Wang & Guthrie 2004; Hoffman, 2012; Sikora 2013). Students' motivation in L2 reading can be observed by using intrinsic-extrinsic reading motivational questionnaire. Communicating, teaching, and using appropriate teaching materials and educators of ESL should promote all types of motivation in the classroom and guide students towards achieving goals (Azar &Tanggraju , 2020 ; Azar & Sahar, 2021).

CONCLUSION

Based on results and discussion that brain targeted teaching model with online instruction had a statistically significant influence on the students' reading achievement and motivation. Based on finding and discussing, brain-based targeted teaching model v/s activating students' content schemata technology support had three conclusions. The students' achievement in critical reading taught by brain targeted teaching model with online instruction is effective. There is statistically significant influence on the students' motivation and achievement in Reading comprehension. There is an interaction between teaching strategy and students' motivation level in students' achievement in critical reading.

Based on the results, they can be concluded that

1. There is distinct impact between brain targeted teaching model v/s students' content schemata with online instruction in reading to students' different motivation level in students' achievement in EFL critical reading course
2. The achievements of students with high motivation in the EFL reading course get higher than those with low motivation
3. There is an interaction between teaching strategies and the level of students' motivation in students' achievement in EFL critical reading course.

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