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THE EFFECT OF IRAES READING TECHNIQUE ON ENHANCING CRITICAL THINKING IN ENGLISH READING AMONG HIGH SCHOOL STUDENTS IN SICHUAN, CHINA

Wen Jia^{1*}, Nor Hazwani Munirah Lateh²

¹ Faculty for Language Studies and Human Development, Universiti Malaysia Kelantan, Malaysia
Email: 2017103006@yibinu.edu.cn

² Faculty for Language Studies and Human Development, Universiti Malaysia Kelantan, Malaysia
Email: hazwani.l@umk.edu.my

* Corresponding Author

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Abstract:

English language has become a major concern among China government, as their economy growing need a diverse language in communicating with the foreigner, including expand their economy outside China. However, English language adoption among the student remain low, by that situation has make a hurdle for the government to escalated China economy into next step. Therefore, the IRAES approach has become part of the point in embedment of English education teaching and learning among high school in Sichuan, China. The analyse have been conducted among 200 respondents for each Group A and B each with pre-test and post-test analysis. The result has showed that the Group A with IRAES intervention, has significantly improved the student in term of their critical thinking skills and reading comprehension. This result contributed and benefited to the relevance stakeholders, particularly for government, students and teacher in teaching and learning approaches policy improvement.

Keywords:

IRAES, Pre-Test and Post-Test, Critical Thinking, English Reading, High School Student

Introduction

Reading plays a fundamental role in cognitive and intellectual development, serving as a gateway to knowledge acquisition, analytical reasoning, and problem-solving (Agustina & Ro'isatin, 2024). Beyond basic comprehension, reading fosters deeper cognitive engagement

when paired with critical thinking strategies. This is particularly crucial in English as a Foreign Language (EFL) learning, where students often struggle to engage with texts beyond surface-level understanding due to linguistic and cognitive barriers (Xu & Knijnik, 2023). The integration of critical thinking into reading instruction is now widely recognized as an essential pedagogical approach that enhances learners' analytical reasoning, argument evaluation, and reflective judgment.

In Sichuan China, the integration of critical thinking into English as a foreign language among the student has caught significant attention to government (Xu & Knijnik, 2023). It has become part and partial of critical factor to attract the foreigner come to China. As for that a lot of activity has come into consideration in language learning nowadays. However, there is a hurdle among student and educator as it is not their language expertise. An educator recognises that the traditional teacher centred method often challenging in developing student in improving their English language skill. By far, there is some interventions have been conducted by the government in escalates this English learning among the student including educator teaching method. The approach from Inquiry Based Learning and Teaching (IBLT) to enhance learners critical thinking abilities in English. Apart from that this approach also has been aligned with the China's National English Curriculum Standards (Cleaver et al., 2018). This standard has emphasized the important of fostering critical thinking in language education.

There is research have been conducted in China that highlighted the necessity of integrating of critical thinking into English language learning teaching (Chen, Zhang, & Li, 2023). That study has suggested, by developing student thinkings competency is part of essential for effective language acquisition and comprehension. By engaging this approach among the students in critical reading and analytical discussion, education able to help the student face the challenge and hurdle in linguistic and cognitive barriers, lead to improve problem solving skill and deeper understanding of the text.

Furthermore, the disparities in education resources between rural and urban areas as well as variation in student exposure to English outside the classroom. It has become a critical issue in English education learning and teaching that the current approach could not cater into this part and insufficient. To address this, the identify, reflect, analyse, evaluate, and solve (IRAES) framework has been increasingly integrated into English reading instruction to enhance critical thinking. The IRAES model able to encourage students to identify main ideas and themes withing texts and promoting comprehension. In reflective it shows on the author intent, the cultural context, and personal interpretation in any context. Next, analyse the textual structural, arguments, and underlying assumptions is critical to be accurately interpreted. This is to evaluate the different perspectives, biases, and the credibility of sources. By having this, the trajectory can solve comprehension challenges by synthesising information and constructing reason arguments from all the contexts (Chen, Zhang, & McNaughton, 2023).

Reading is not merely a passive activity but a powerful tool for cognitive and intellectual development. In the EFL context, integrating critical thinking with reading is crucial for fostering analytical reasoning, independent judgment, and deeper comprehension (Degen et al., 1998; Guofang Li & Xiaopeng Ni, 2011; Qiang & Wolff, 2007). The IRAES reading technique provides a structured framework that enables students to actively engage with texts, overcome comprehension barriers, and develop higher-order thinking skills. Future research should explore longitudinal studies to assess the long-term impact of IRAES on academic performance

and its adaptability to digital learning environments. Thus, this paper is aimed to explore the critical thinking ability among the student with the IRAES approach. By understanding this within the result context of the study, this paper would be able to provide a significant viewpoint to the relevant stakeholders in improving the teaching and learning outcomes in English as a foreign language.

Literature Review

The Important of Critical reading and Its Strategy

Critical reading involves analysing a text that beyond surface level, it requires the reader to understand a question its meaning, source, and intent. Plus, it also requires an active engagement in identifying the author arguments, assumption, and evidence to provide a well form of justification and judgement. There is a study have been conducted, that studied has suggested that developing critical reading skills able to improves person reading comprehension, analytical thinking, and self-efficacy of themselves (Agustina & Ro'isatin, 2024; Barjesteh & Vaseghi, 2012).

Therefore, there are four strategies in developing a critical thinking in reading, that is, identifying causal chains, making inferences, evaluating disadvantages and advantages, and using visual aids as tools. In identifying causal chains, the readers need to recognise cause and effect relationships within texts aids in understanding an argument's structure, and logical coherence from the established text provided (Lu & Xie, 2024). Then, for making inferences based on the provided context, the readers need to draw a conclusion from the contextual clues as it would help uncover the implicit meaning of the text sentence. From that action, in evaluating advantage and disadvantage enable the reader to make a comparative analysis in assessing an argument significantly and critically. Finally, to interpret all the justification and judgement the readers need to use visual aids to organise all the information into graphical by comparative insight and conceptual relationship. In conclusion, these four strategies serve as an essential tool for developing critical thinking in reading for a reader. As these strategies able to empower readers engage with text more effectively and ultimately strengthen their understanding and critical thinking skills (Lu & Xie, 2024).

Theoretical Frameworks Supporting Critical Reading

Critical reading is grounded in several theory such as Bloom's Taxonomy, Paul and Elder's Critical Thinking Framework, Social Cultural Theory, The IRAES Model, and Schema Theory (Chang, 2009; Lu & Xie, 2024). Hence, in this paper there are only one prominent theory used in this study paper, that is the IRAES Model. This model is a structured framework that start with the identify, reflect, analyse, evaluate, and solve. It designs to enhance critical reading by guiding readers through systematic approaches, so that the readers able to understand and interpret text. Apart from that, it also able to help readers align with cognitive development theories and critical thinking principles. As it provides comprehensive method in engaging with complex reading, in which in this context is focus on English language.

The first stage, Identify, requires readers to recognize key information within a text, including its main arguments, supporting evidence, and underlying assumptions. This step helps establish a clear foundation for deeper analysis. Next, in the Reflect stage, readers consider their prior knowledge, personal experiences, and potential biases that might influence their understanding.

Reflection encourages metacognition, allowing individuals to assess how their perspectives shape their interpretation of the text (Xu, 2011).

The Analyse phase involves breaking down the text into its components, examining the relationships between ideas, and assessing logical coherence. Readers identify patterns, inconsistencies, and rhetorical strategies used by the author. Following this, the Evaluate stage focuses on assessing the credibility, accuracy, and significance of the information. Here, readers determine whether arguments are well-supported, distinguish between fact and opinion, and assess the strength of the evidence presented. Finally, the Solve stage encourages readers to apply their insights to real-world contexts, generate new perspectives, or propose solutions to issues discussed in the text. This step fosters higher-order thinking by transforming reading into an active, problem-solving process rather than passive consumption of information (Barjesteh & Vaseghi, 2012).

In conclusion, by systematically following the IRAES Model, readers develop deeper critical reading skills and improving their ability to engage with complex texts. This approach also includes with an assess arguments objectively and apply their understanding in meaningful ways. This model is particularly useful in academic settings, where analytical reading and critical evaluation are essential for academic success and intellectual growth.

Methodology

This study employs a quasi-experimental design with a pre-test and post-test approach to measure the effectiveness of the IRAES Model (Identify, Reflect, Analyze, Evaluate, Solve) in developing critical reading skills among EFL students in Sichuan, China (Quiroz et al., 2021). A total of 400 university students from Sichuan will be selected and divided into two groups: Group A (Experimental Group, $n = 200$), which will receive instruction using the IRAES Model, and Group B (Control Group, $n = 200$), which will follow conventional reading instruction without structured critical thinking integration. This study aims to assess the impact of the IRAES Model on enhancing students' ability to engage with texts analytically and critically (Quiroz et al., 2021).

Before the intervention, both groups will take a pre-test to assess their baseline critical reading skills. The test will include multiple-choice and short-answer questions covering comprehension, inference-making, argument analysis, evaluation of textual validity, and problem-solving using textual information. The test will be administered under identical conditions in a classroom setting with a time limit of 60 minutes. Scores will be recorded and analysed to ensure both groups have comparable initial proficiency levels.

Following the pre-test, Group A will undergo 6-8 weeks of training using the IRAES Model. The intervention will consist of guided reading exercises, collaborative discussions, and practice assessments designed to systematically enhance critical reading. Participants will be trained to identify key ideas, reflect on biases, analyse logical structures, evaluate evidence, and solve real-world problems through text interpretation. Meanwhile, Group B will continue with traditional reading instruction, focusing primarily on comprehension and vocabulary development without structured critical thinking strategies (Bordens & Abbott, 2002).

After the intervention, both groups will take a post-test, which will be a parallel version of the pre-test, measuring the same skills with different content. The post-test will assess improvements in critical reading comprehension, analytical reasoning, and evaluative judgment. Data will be analysed using paired-sample t-tests or Wilcoxon signed-rank tests to compare pre-test and post-test scores within each group. Additionally, independent t-tests or Mann-Whitney U tests will be used to compare post-test scores between the experimental and control groups to determine the impact of the IRAES Model.

It is expected that students in Group A (IRAES-trained learners) will demonstrate significant improvement in their ability to analyse, evaluate, and interpret texts critically, while students in Group B (Control Group) may show only moderate improvements due to the absence of structured critical thinking training. A significant difference in post-test scores between the two groups will confirm the effectiveness of the IRAES Model in enhancing critical reading skills among EFL students in Sichuan, China. This structured pre- and post-test method ensures a rigorous, evidence-based approach to evaluating the impact of critical reading strategies in a Chinese academic setting.

Findings

The findings of this paper have been analysed from the 200 respondents at each Group A and Group B, total up at 400 respondents. The analyse use a pre-test and post-test analysis with SPSS as tools of analysis. Apart from that, this study also uses a Levene's Test for equality variance ensure that the data is highly confident and credential to be generalised for the whole population of the data.

Table 1: Descriptive Statistics for Pre-Test and Post-Test Scores

Group	N	Mean	Std. Deviation	Std. Error Mean
Group A (Pre-Test)	200	58.2	8.5	0.60
Group B (Pre-Test)	200	57.9	8.2	0.58
Group A (Post-Test)	200	78.6	7.9	0.56
Group B (Post-Test)	200	65.4	7.6	0.54

Table 1 presented the descriptive statistics pre-test and post-test scores for Group A and Group B with each encompassing of 200 respondents. Prior any intervention conducted for, Group A had a mean score of 58.2 at SD = 8.5, while Group B had a slightly lower mean of 57.9 at SD = 8.2. Then the standard deviations have indicated a moderate variability in both groups, with Group A showing slightly higher dispersion in scores. The standard error of the mean (SEM) was 0.60 for Group A and 0.58 for Group B, and this has suggested a similar level of precision in estimating the population mean for both groups (Conner & Johnson, 2017).

Next, after the intervention, Group A's mean showed a score increased significantly to 78.6 at SD = 7.9, while Group B's mean also has rose up to 65.4 SD = 7.6. The improvement in Group A for 20.4 points was substantially larger than that of Group B at 7.5 points. This result, both groups exhibited slightly lower standard deviations in the post-test phase at 7.9 for Group A and 7.6 for Group B. Resulting a reduction in score variability, which suggests a more consistent effect of the intervention. The standard errors also decreased slightly (0.56 for Group A and 0.54 for Group B), meaning the post-test estimates are slightly more precise than those in the pre-test (Amrhein et al., 2019).

In summary, this table results suggest that while both groups improved after the intervention, Group A demonstrated a much larger increase in mean scores compared to Group B. The reduction in standard deviation and standard error in both groups indicates that the post-test performance was more stable. Thus, the observed differences in means suggest a potentially significant effect of the intervention, particularly for Group A.

Table 2: Paired Samples T-Test for Pre-Test and Post-Test Scores

Group	Mean Difference	t-value	df	Sig. (2-tailed)
Group A (Pre vs. Post)	20.4	14.82	199	0.000***
Group B (Pre vs. Post)	7.5	5.91	199	0.001**

*Significance levels: $p < 0.05$, $p < 0.01$, $p < 0.001$

Tabel 2 presented the paired samples t-test shows that both Group A and Group B improved significantly from pre-test to post-test, but Group A had a much larger improvement. In details, Group A has improved by 20.4 points, with a very strong statistical effect at $t = 14.82$, $p < 0.001$, meaning the improvement is highly significant. While for Group B shows an improved by 7.5 points, with a moderate effect at $t = 5.91$, $p < 0.01$, showing a smaller but still meaningful improvement. Hence, Group A's improvement is much larger and more statistically significant, this suggests that the intervention had a much stronger effect on Group A compared to Group B (Lindstromberg, 2016).

Table 3: Independent Samples T-Test (Post-Test Scores of Group A vs. Group B)

Levene's Test for Equality of Variances	t-test for Equality of Means
F = 2.41, Sig. = 0.121	$t = 10.45$, df = 398, Sig. (2-tailed) = 0.000***
Mean Difference = 13.2	Std. Error Difference = 1.26
95% Confidence Interval: [10.72, 15.68]	

Table 3 is about the results of Independent Samples T-Test with Levene's Test approach for Equality of Variances. The result show $F = 2.41$, Sig. = 0.121, indicating that the assumption of equal variances is not violated ($p > 0.05$). This allows for the use of the standard independent samples t-test to compare the means of the two groups. The t-test for equality of means yielded $t = 10.45$, df = 398, $p < 0.001$, confirming a highly significant difference between the two groups. The mean difference of 13.2 points, with a standard error of 1.26, suggests a clear and consistent gap in performance. Furthermore, the 95% confidence interval [10.72, 15.68] reinforces the statistical significance, as it does not include zero, meaning the difference is unlikely to be due to chance. Overall, the findings provide strong evidence that one group performed significantly better than the other, suggesting that the treatment or intervention had a substantial impact (Amrhein et al., 2019).

Conclusion and Discussion

In this final part of this paper, based on earlier part findings and literature review in this paper. It has been clear that this paper has met its paper objectives, as it has demonstrated that the IRAES reading technique is an effective approach to enhancing critical thinking skills and reading comprehension among high school students in Sichuan, China. The results indicate a significant improvement in Group A (IRAES group) compared to Group B (traditional reading method). Group A exhibited a mean increase of 20.4 points in post-test scores, while Group B

showed a more minor but significant improvement of 7.5 points. The paired samples t-test confirmed that both improvements were statistically significant, with Group A showing a much stronger effect. Additionally, the independent samples t-test confirmed that Group A significantly outperformed Group B in the post-test, with a mean difference of 13.2 points ($t = 10.45$, $p < 0.001$) with the reliability of the result confident at 95%. This result has indicated that the IRAES approach had a meaningful impact on students' ability to analyse and evaluate texts critically.

Moreover, these findings significantly contributed to the extent of the IRAES literature with the use of respondent among high school in Sichuan, China. In addition, this paper suggesting that structured critical thinking interventions improve language learning outcomes. The IRAES model, with its Identify, Reflect, Analyse, Evaluate, and Solve framework, provides a systematic approach to engaging students with texts beyond surface-level comprehension. By guiding students through structured critical reading exercises, the model helps them develop higher-order thinking skills, such as argument evaluation, bias detection, and logical reasoning. The study findings also highlighted that the important pedagogical implications for the teaching and learning in high school approach. The traditional reading instruction in Group B, which focuses on comprehension and vocabulary without explicit critical thinking strategies, resulted in only moderate improvements. This suggests that conventional methods may not be sufficient to develop critical thinking skills effectively. Teachers should integrate structured models like IRAES to foster deeper engagement with texts and enhance students' analytical reasoning.

In summary, future research suggested to explore the long-term impact of IRAES on academic performance and investigate its adaptability to digital learning environments and diverse student populations. Plus, studies also could examine on how student motivation, prior knowledge, and teacher training influence the model's effectiveness. Given the strong evidence supporting the effectiveness of the IRAES Model, it is recommended that educators implement this approach more widely in EFL classrooms. By doing so, it can enhance reading comprehension, critical thinking, and overall academic performance, ultimately better-preparing students for higher education and real-world problem-solving.

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References

- Agustina, L., & Ro'isatin, U. A. (2024). The Efficacy of Case-Based Learning Model Integrated with Critical Thinking Skills to Improve EFL Learners' Reading Comprehension. *Journal of Languages and Language Teaching*, 12(3), 1443–1454.
- Amrhein, V., Trafimow, D., & Greenland, S. (2019). Inferential statistics as descriptive statistics: There is no replication crisis if we don't expect replication. *The American Statistician*, 73(sup1), 262–270.
- Barjesteh, H., & Vaseghi, R. (2012). Critical thinking: A reading strategy in developing English reading comprehension performance. *Journal of Foreign Language Teaching and Translation Studies*, 1(2), 21–34.
- Bordens, K. S., & Abbott, B. B. (2002). *Research design and methods: A process approach*. McGraw-Hill.

- Chang, C.-A. T. S.-Y. (2009). *Developing critical thinking through literature reading*. <http://dspace.fcu.edu.tw/handle/2376/2536>
- Chen, S., Zhang, L. J., & McNaughton, S. (2023). The Structure and Characteristics of Chinese University English Teachers' Identities: Toward a Sustainable Language Pedagogy. *Sustainability*, 15(15), 12040.
- Chen, S., Zhang, Y., & Li, R. (2023). A Study on Undergraduate English Program Modes in China. *Education Sciences*, 13(12), 1241.
- Cleaver, E., Lintern, M., & McLinden, M. (2018). *Teaching and learning in higher education: Disciplinary approaches to educational enquiry*. Sage.
- Conner, B., & Johnson, E. (2017). Descriptive statistics. *American Nurse Today*, 12(11), 52–55.
- Degen, T., Absalom, D., & Australia, C. (1998). Teaching across cultures: Considerations for Western EFL teachers in China. *Hong Kong Journal of Applied Linguistics*, 3, 117–132.
- Guofang Li & Xiaopeng Ni. (2011). Primary EFL Teachers' Technology Use in China: Patterns and Perceptions. *RELIC Journal*, 42(1), 69–85. <https://doi.org/10.1177/0033688210390783>
- Lindstromberg, S. (2016). Inferential statistics in Language Teaching Research: A review and ways forward. *Language Teaching Research*, 20(6), 741–768.
- Lu, D., & Xie, Y.-N. (2024). Critical thinking cultivation in TESOL with ICT tools: A systematic review. *Computer Assisted Language Learning*, 37(1–2), 222–242. <https://doi.org/10.1080/09588221.2022.2033788>
- Qiang, N., & Wolff, M. (2007). EFL/ESL teaching in China: Questions–questions–questions. *Frontiers in Higher Education*, 229–251.
- Quiroz, M. F., Gutiérrez, R., Rocha, F., Valenzuela, M. P., & Vilches, C. (2021). Improving English Vocabulary Learning through Kahoot!: A Quasi-Experimental High School Experience. *Teaching English with Technology*, 21(2), 3–13.
- Xu, J. (2011). The application of critical thinking in teaching English reading. *Theory and Practice in Language Studies*, 1(2), 136–141.
- Xu, W., & Knijnik, J. (2023). English as a world opener in Chinese universities: Fostering interculturally aware communities of learners in the English reading classroom. *Pedagogy, Culture & Society*, 1–17. <https://doi.org/10.1080/14681366.2023.2174171>