Essential Tools for Developing Critical Reading: A Structured Guide for Undergraduate Students

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ABSTRACT

Developing strong critical reading skills is essential for undergraduate student success. Despite the increasing demand for critical reading and thinking abilities in the global job market, many students face challenges in acquiring these competencies, which impacts their academic performance and future career opportunities. The purpose of this structured guide is to present a comprehensive review of key strategies for building critical reading skills among undergraduate learners. Drawing from a thorough analysis of scholarly articles, textbooks, and empirical studies, the review identifies essential tools for enhancing critical reading; strengthening vocabulary and language comprehension, identifying main ideas and supporting details, constructing topics and providing evidence, making inferences, and recognizing implied meanings, understanding types of support and applying reasoning, evaluating arguments and analysing statements, and conducting contextual analysis to detect underlying assumptions. These tools form a structured guide that educators and researchers can utilise to design effective instructional approaches, activities, and assessments, thereby fostering critical reading skills in their students. The guide offers a comprehensive foundation for enhancing undergraduate academic performance and career readiness. Future research should focus on validating the framework and exploring the influence of cultural and linguistic differences on critical reading development in diverse student populations.

Keywords: Critical reading skills, critical reading activities, critical reading assessment, critical reading instruction, comprehensive literature review.

INTRODUCTION

In the highly competitive education landscape today, developing critical solid academic reading skills is a fundamental factor for students' success in higher education (Lundberg, 2022). However, despite the growing demand for critical thinking and reading skills in the global job market, many undergraduate students face challenges in acquiring these skills when they are expected to perform academic reading at any time during their studies (Castaño-Roldán & Correa, 2021; Eze et al., 2022). This, in turn, hampers their academic performance and limits their employment prospects. Wallace and Wray (2021) emphasise the importance of developing critical reading skills within the academic scope to achieve academic excellence. Similarly, Shamida et al. (2021) reported that postgraduate students exhibited restricted critical reading skills. In addition, Sidhu et al. (2016), in their research investigating the critical reading competencies of postgraduate students found that students displayed a limited degree of proficiency in the area of critical reading. The investigation also disclosed that these students encountered challenges while analysing and interpreting the texts.

The above studies have drawn attention to students' linguistic and non-linguistic challenges when they participate in critical academic reading. It is believed that multiple factors contribute to the challenges students face in comprehending reading materials. These factors include their language proficiency, limited background knowledge, (Arifin, 2020), and insufficient critical reading skills, which include the ability to interpret the author's intended message, distinguish between statements based on facts and those based on opinions, identify and infer main ideas, derive meanings from context, and make logical deductions (Din, 2020; Le et al., 2024).

Research into critical academic reading is also concerned with measuring critical academic reading skills. While critical thinking and reading abilities are crucial for undergraduate success, researchers are deliberating over effective methods to measure critical academic reading skills. Facione (1990) proposed a multiple-choice-question tool for critical thinking assessment, yet concerns persist about its ability to capture the multifaceted nature of critical thinking. (Ennis, 2011; Facione, 1990; Sarwanto et al., 2020; Sari et al., 2019; Watson & Glaser, 2002) introduced indicators for assessing critical thinking skills and (Anuar et al., 2023; Olifant et al., 2020; Sultan et al., 2017; Zin et al., 2014) offers a self-administered instrument to gauge critical reading skills in specific areas. The development of these instruments and the debate surrounding their effectiveness highlight the importance of creating an instrument capable of accurately measuring critical reading skills.

As academic researchers, it is imperative to acknowledge and tackle the prevalent global concern about the deficiency of critical reading skills among undergraduates, particularly in the Malaysian context. Several studies conducted in Malaysia reported the existence of limited academic reading proficiency among graduate and postgraduate students in the country (Anuar & Sidhu, 2017; Sidhu et al., 2013; Singh et al., 2014, 2015, 2019; Zhang & Hasim, 2023; Zin et al., 2014). The findings from past studies emphasised the pressing need for further investigation and focused interventions in this area. In order to help increase the student's ability to deal with academic reading, this study aims to construct a comprehensive framework for fostering critical reading skills among undergraduate students in Malaysia. This framework holds the potential to offer valuable insights aimed at addressing this issue and enhancing academic achievements among students worldwide. The study also intends to provide guidelines that would enable the development of an effective instrument to measure critical academic reading skills.

The following objectives were set to assist the development of this framework:

- To identify the essential skills for undergraduate students to attain proficiency in critical reading.
- To synthesise and compare existing literature regarding the skills and components required to develop critical reading skills among undergraduate students.
- To propose guidelines that can be used to develop a set of questionnaires to measure critical academic reading skills among undergraduate students in Malaysia.

To achieve these objectives, three main research questions were developed:

1. What are the essential skills for undergraduate students to attain proficiency in critical reading?
2. What are the different skills and components required to develop critical reading skills, as mentioned by previous researchers?
3. What are the proposed guidelines that can be used to develop a set of questionnaires to measure critical academic reading skills among undergraduate students in Malaysia?

LITERATURE REVIEW

Critical Reading Proficiency of Malaysia Undergraduate Students

In an increasingly interconnected and technologically advanced world, reading critically is widely recognised as an imperative proficiency for college graduates (Arifin, 2020; Mee et al., 2017; Van et al.,

2022) believe that reading critically is necessary to comprehend texts, engage in informed discussions and debates, and arrive at well-informed decisions based on evidence and logic. They also gathered that students who possess critical reading skills can proficiently analyse and assess reading materials provided to them, particularly concerning the author's credibility and the concepts and facts presented in the texts.

In the Malaysian academic context, many scholarly investigations have documented a noteworthy similarity in the critical reading proficiency of tertiary-level students, that in general students possess limited proficiency in critical academic reading (Anuar & Sidhu, 2017; Rahman et al., 2021, 2020; Sidhu et al., 2013; Singh et al., 2014, 2015, 2019; Zhang & Hasim, 2023; Zin et al., 2014)

Previous research conducted in Malaysia on academic reading has predominantly focused on the challenges encountered by students. It is worth noting that the recent studies carried out in this area by Rahman et al. (2021) and Rahmat et al. (2020) hold significant importance. Rahman et al. (2021) examined the challenges faced by students while reading scholarly texts. The findings revealed that students encounter linguistic and non-linguistic challenges during academic reading, and they utilised their existing knowledge and socio-affective strategies to manage these challenges.

In another study, Rahmat et al. (2020) conducted a study that aimed to investigate the fear, and perceived difficulties experienced by Malaysian undergraduate students in the context of academic reading. The researchers identified several factors that could impact readers' perception of fear, including unfamiliar topics, unknown pronunciation, vocabulary and grammar level in a reading text, and the teaching and reading strategies employed in academic classrooms. Furthermore, Abu Abeelah et al. (2021) and Hezam et al. (2022) support these findings by highlighting that students with insufficient vocabulary and challenges in understanding complex sentence structures usually exhibit limited competence in reading. Hence, these findings highlight how vocabulary, grammar, and reading strategies impact both students' reading abilities and their confidence when approaching academic texts.

The challenges are not limited to only Malaysian students. The international students pursuing their studies in Malaysian universities are also facing the same struggles related to their critical reading skills as evidenced by a study conducted by Alghail and Mahfoodh (2016). Their study investigated the perceptions of academic reading difficulties among international graduate students. The study five significant difficulties faced by participants: summarising information effectively through concise note-taking, accurately paraphrasing information, comprehending complex vocabulary, identifying supplementary ideas and examples, and managing time efficiently to complete assigned readings. These findings highlight the relevance of critical reading challenges experienced by international students in the context of Malaysian higher education.

Furthermore, Singh et al. (2014; 2015), in their research on international students' difficulties in academic reading and writing, found that the primary challenges were associated with English not being the students' native language and their limited proficiency in English. Limited English proficiency could result in difficulties in grasping complex vocabulary, restating information, summarising information through brief note-taking, and effectively managing their time to complete assigned readings. In an academic setting, these challenges often result in slower reading speeds and a greater dependence on instructors' notes.

Lastly, critical reading research by Yunus and Ubaidillah (2021) found that critical academic reading should involve the ability to grasp the implicit meaning conveyed in the text research, which includes evaluating the truthfulness or accuracy of a text, identifying the author's purposes, making inferences, finding hidden messages, constructing meanings from the text, asking questions, expressing opinions and judgments, examining claims and counterclaims, questioning (and evaluating) text, and looking for evidence for any information or meaning derived from the text.

The review of the literature highlights the necessity for addressing the challenges in critical reading proficiency among Malaysian tertiary-level students include both linguistics and non-linguistics challenges.

Among the challenges including limited proficiency in English and the inability to summarise, paraphrase and comprehend information effectively. Drawing upon the insights provided by previous studies (Alghail & Mahfoodh, 2016; Anuar & Sidhu, 2017; Arifin, 2020a; Mee et al., 2017; Rahman et al., 2021; Rahmat et al., 2020; Singh et al., 2014, 2015; Van et al., 2022) the current study aims to examine further the factors contributing to limited critical reading skills and propose interventions to enhance students' ability to respond to academic reading texts critically and analyse complex texts.

Measuring Critical Thinking Skills and Critical Academic Reading Skills

In the contemporary era of fast and intense competition, acquiring critical thinking and reading abilities is imperative for achieving academic excellence and advancing in one's professional endeavours. While these skills are essential among undergraduates, measuring to what extent they are able to perform the skills should be the concern of researchers and scholars.

Critical Thinking Skills and Critical Academic Reading Skills Instruments

There are a few common Critical Thinking Skills and Critical Academic Reading Skills instruments used to measure the skills among the learners. The Critical Thinking Skills instruments that researchers, educators, and practitioners widely use are The Watson-Glaser Critical Thinking Appraisal (WGCTA), California Critical Thinking Test (CCTST), Cornell Critical Thinking Test (CCTT), Critical Thinking Skills Test, and Perception Test (PSCS). Meanwhile, the Critical Reading Skills instruments are Critical Reading Inventory (CRI), Critical Reading Comprehension Test (CRCT), Critical Reading Intention Scale (CRIS), and Critical Reading Self-Perceptions and Ability. The components that are being measured are as follows:

Table 1: Critical Thinking Instruments

Instruments	Test components	Developers
Watson-Glaser Critical Thinking Appraisal (WGCTA)	Inference (Drawing conclusions from given information) Recognition of Assumptions (Drawing Conclusions from given information) Deduction (Determining if conclusions logically follow from given information) Interpretation (Weighing evidence and deciding if conclusions are justified) Evaluation of Arguments (Assessing the strength and relevance of arguments)	Watson and Glaser (2002)
California Critical Thinking Skills Test (CCTST)	Interpretation (Comprehending content, categorization, and clarifying meaning) Analysis (Identifying and examining ideas, arguments, and claims) Evaluation (credibility of statements, assessing claims, and assessing arguments) Inference (draw conclusions, query evidence) Explanation (Stating results, justifying procedures, and presenting arguments)	Facione, 1990

Cornell Critical Thinking Test (CCTT) Z	Deduction meaning and fallacies, observation and credibility of sources induction and definition assumption identification	Ennis, 2011
Critical Thinking Skills Test	Basic classification Decision-making foundations Inference Advanced classification Supposition and integration	Sari et al. (2019)
Perception Questionnaire (Adapted from PSCS)	Pedagogic strategy Interest in learning Student interest and perception of competence Passive learning Value of feedback Laboratory experience	Sari et al. (2019)
Feasible open-ended questions to assess critical thinking skills	Interpretation Analyse Inference Explanation	Sarwanto et al. (2020)

Table 1 provides information on the range of components used to measure critical thinking skills, reflecting their complex cognitive nature. Ennis (2015) provides a comprehensive framework. The California Critical Thinking Test developed by Facione (1990) focuses on core critical thinking skills, aligning with Ennis's framework in a more standardized format (Bellaera et al., 2021). Similarly, the Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 2002) measures five specific areas: inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments (Alsaleh, 2020). The Watson-Glaser Critical Thinking Appraisal (WCGTA) features five sub-scores such as inference, recognition of assumption, deduction, interpretation, evaluation, and evaluation of an argument (Watson-Glaser Practice Test, n.d.; Alsaleh, 2020). According to Alsaleh (2020), the test has been evaluated for validity and reliability in measuring CT at the college level for years, indicating its effectiveness as an assessment instrument.

Next is the California Critical Thinking Skills Test (CCTST) is a widely used standardized test for assessing critical thinking skills (Facione, 1990a). This test measures five key aspects of critical thinking: analysis, evaluation, inference, deduction, and induction (Rear, 2019). However, some research has raised concern about the reliability and validity of the CCTST, particularly regarding its subscales (Rear, 20190. Leppa (1990) found that the five subscales of the CCTST have low internal consistency, ranging from .21 to .51, which is much lower than the reliabilities reported by the test authors. Ku (2009) concluded from a review of studies that CCTST had "poor construct validity, unstable reliability, and low comparability between its two forms "(as cited in Rear, 2019).

Cornell Critical Thinking Test Level Z(CCTT) is a widely used assessment of critical thinking for undergraduate, gifted students and adults critical thinking abilities which focuses on five key dimensions: deduction, meaning and fallacies, observation and credibility of sources, induction, and definition and assumption identification (Barta et al., 2024; Leach et al., 2020; Verburgh et al., 2013). Research has highlighted both its strengths and limitations. For instance, Verburgh et al. (2013) discussed the psychometric challenges associated with the CCTT-Z, noting that while it effectively measures these critical thinking dimensions, its overall reliability can be problematic. This finding aligns with other studies, such as by Barta et al. (2024) and Leach et al. (2020), which also emphasise the need for careful validation of the test's structure and application across diverse contexts to ensure its effectiveness (Barta et al., 2024; Leach et al., 2020; Verburgh et al., 2013).

Apart from the previous critical thinking instruments, Sari et al. (2019) discussed a set of indicators to assess students' critical thinking skills, which encompassed the following dimensions: (i) basic classification, (ii) decision-making foundations, (iii) inference, (iv) advanced classification, and (v) supposition and integration. Quantitative data were collected using a perception questionnaire and a critical thinking skills test. The perception questionnaire, adapted from the Perception of Science Classes Survey (PSCS), consisted of 55 questions distributed across six factors: pedagogic strategy, interest in learning, student interest and perception of competence, passive learning, the value of feedback, and laboratory experience. The questionnaire was validated by language and learning professionals. The findings indicated that 1) students' understanding of scientific learning fell into the medium category, 2) students' critical thinking abilities were categorised as low, 3) differences in perception and critical thinking abilities were observed based on the school, but no differences were found based on gender, 4) students' perception influenced their critical thinking abilities in a scientific learning approach. To enhance students' positive perception and nurture their critical thinking abilities, Sari et al. (2019) suggested implementing innovative learning methods, engaging students in activities, and provisioning of recommended learning facilities. This study suggests that identifying students' perceptions could help to develop supportive learning environments to improve students' critical thinking skills.

Therefore, critical thinking assessment tools such as the California Critical Thinking Skills Test (CCTST), Watson-Glaser Critical Thinking Appraisal (WCGTA), and Cornell Critical Thinking Test Level Z (CCTT-Z) deliver insights into measuring critical thinking across various educational levels. However, challenges remain regarding their reliability and validity, as raised in studies by Verburgh et al. (2013), Leppa (1990), and Ku (2009). These findings suggest ongoing validation and refinement to improve their effectiveness across diverse contexts (Barta et al., 2024; Leach et al., 2020). Recent studies emphasise the need for innovative teaching strategies to enhance critical thinking (Sari et al.,2019). Future research should focus on improving existing assessments and developing new instruments that better reflect critical thinking complexity. (Barta et al., 2024; Sari et al., 2019). These efforts should consider students' perspectives and learning contexts. The research is essential for developing critical reading and thinking assessments for better educational outcomes.

Table 2: Critical Reading Skills Instruments

Instruments	Test components	Developers
Critical Reading Skills Assessment (CRSA)	• Interpreting • Analysing • Making inferences • Evaluating • Explaining • Self-regulating	Sultan et al. (2017)
Critical Reading Comprehension Test (CRCT)	• Analytical skills • Identifying the writer's purpose • Main ideas in the text	Zin et al. (2014)

Critical Reading Intention Scale (CRIS)	• Behavioural belief • Attitude • Normative Belief • Subjective Norms • Control belief • Perceived Behavioural Control • Intention	Anuar et al. (2023)
Critical Reading Self Perceptions and ability	• Knowledge • Comprehension • Application • Analysis • Synthesis • Evaluation	Olifant et al. 2020

Table 2 provides the components measured for Critical Reading Skills to measure critical academic reading skills for the different skills involved (Anuar et al.,2014; Sultan et al., 2017 & Zin et al.,2014). Critical Reading Skills Assessment (CRSA) was developed by Sultan et al. (2017) to evaluate their critical reading learning model. The CRSA, comprising 40 multiple-choice and essay questions, measured six critical reading skills: interpreting, analysing, inferencing, evaluating, explaining, and self-regulating. Using a -re-test/post-test design, the study found significant improvement in the experimental group's performance (M = 70.86) compared to the control group (M = 48.02), with a statistically significant difference (t = 13.358, p < 0.05). This improvement shows the CRSA's effectiveness in measuring students' critical reading abilities, including their ability to analyse ideological messages and develop counterarguments (Sultan et al., 2017). Meanwhile, the Critical Reading Comprehension Test (CRCT) developed by Zin et al. (2014), used two expository with multiple-choice and open-ended questions to assess skills like identifying the writer's purpose, main ideas, and analytical abilities. The CRCT effectively revealed students' critical reading skills, with only 34% correctly identifying the writer's purpose and 44% identifying the main idea. The qualitative analysis showed that students often quoted directly from the texts and struggled with inference. The test highlighted differences between low and intermediate-proficiency students, with the latter performing better (Zin et.,2014). Overall, the CRCT successfully assessed students' analytical and inferential abilities, confirming previous observations about Malaysian students' critical reading skills. This effectiveness was evident in pinpointing specific weaknesses in students' comprehension, providing valuable insights for ESL instruction (Zin et.,2014).

Other than looking at the specific critical reading skills and subskills involved, Anuar et al. (2014), developed instruments called The Critical Reading Intention Scale (CRIS) to also measure students' intention to participate in critical reading. It comprises 30 items across seven components: Behavioural Belief, Attitude, Normative Belief, Subjective Norms, Control Belief, Perceived Behavioural Control, and Intention. Using a 10-point Likert Scale, CRIS demonstrated strong psychometric properties through a validation process. The instrument displayed good internal consistency reliability (Composite Reliability: 0.774-0.902), convergent validity (AVE > 0.5), construct validity (RMSEA = 0.078, CFI = 0.911, Chi-square/df = 2.871), and discriminant validity. Both Exploratory Factor Analysis and Confirmatory Factor Analysis confirmed its structure (Anuar et al.,2023). CRIS's effectiveness lies in its ability to identify factors influencing students' critical reading intention, potentially helping educators understand and address barriers to critical reading skills development. The instrument provides a valuable tool for assessing and improving critical reading instruction in higher education settings.

Next Olifant et al. (2020) developed a set of questionnaires that is adapted from A taxonomy for learning, teaching and assessing: A revision of Bloom's Taxonomy of educational objectives by An Anderson, L.W. & Krathwohl, D.R., 2001 to measure students' self-perceived and self-rated abilities to use critical reading strategies which focus six strategies including knowledge, comprehension, application, analysis, synthesis and evaluation (Olifant et al. 2020). (Olifant et al., 2020). The effectiveness of these assessments was

demonstrated by their ability to reveal a significant discrepancy between learners' self-perceived critical reading abilities and their actual performance. While learners rated themselves highly on most strategies in the questionnaire, the comprehension activities showed many struggles to apply these strategies effectively. Overall, while the assessments provided valuable data, they also exposed a crucial gap between perception and reality in learners' critical reading competence, providing the need for improved instruction and student self-awareness in this area (Olifant et al. 2020).

Nevertheless, some scholars have raised concerns about using multiple-choice questions as an assessment tool for measuring critical thinking skills. According to Abrami et al. (2015), these scholars argue that such questions do not adequately capture the complex and different aspects of critical thinking.

Given the strengths and limitations of existing critical thinking and reading instruments, researchers developing new tools for the Malaysian context should focus on several key areas. They should ensure high reliability and validity through rigorous testing with Malaysian students. The new instruments should capture the complexity of critical thinking and reading skills, by incorporating both multiple-choice and open-ended questions. Including components that assess students' perceptions and intentions towards critical thinking and reading could provide valuable insights. Thus, these instruments should not only measure skills but also inform teaching strategies to enhance critical thinking abilities among Malaysian students.

Various approaches have been employed to enhance critical reading skills among undergraduate students, encompassing technology-supported training, explicit pedagogical guidance, and metacognitive strategies (Lakshmi, 2019; Kaur & Kumar, 2018).

Based on the study by Edward et al. (2021), it was found that Malaysian undergraduate ESL learners encountered various challenges in comprehending English texts. The challenges encountered comprised deficiency in the comprehension of extensive words, difficulty in apprehending the principal concept of the written work, trouble in identifying the key points, challenges in comprehending English texts, lapse of specific previously learned terminologies, inadequate vocabulary, absence of the habit of reading, interest in pursuing English texts, and the strain exerted by time constraints while reading.

Features of Critical Academic Reading Skills

Table 3 provides a comparative analysis between skills/subskills and questionnaires, which yields significant insights into the multifaceted components of critical reading skills among undergraduate students. By conducting a thorough and exhaustive examination of the literature on critical reading skills surrounding the landmark works of Ariffin (2020), Choon et al. (2014), Edward et al. (2021), Haromi (2014), Facione (1990), Sari et al. (2019) and Teoh et al. (2015) scholars and practitioner can improve their understanding of the fundamental skills and abilities necessary for undergraduate students to excel in both the academic and future careers. These skills aligned with Rosenshine (1980) in pedagogical circles. According to Kadir et al. (2014), Rosenshine (1980) identified three types of reading skills in pedagogical circles: locating detail (recognition, paraphrase, and/or matching), simple inferential skills (understanding words in context, recognizing the sequence of events, and recognizing cause and effect relationships), and complex inferential skills (working with longer texts). Meanwhile, according to Rosenshine (1980), there are seven sub-skills across the three general reading skills, which are recognizing sequence, recognizing words in context, identifying the main idea, decoding detail, drawing inferences, recognizing cause and effect, and comparing and contrasting (Kadir et al., 2014).

Additionally, scholars and practitioners should also consider integrating the data collected by the questionnaire with the insights from previous research to gain a more comprehensive understanding of specific proficiencies and competencies crucial for undergraduate students to succeed academically and in their professional endeavours. This holistic approach to research and assessment can provide a better picture of the skills and knowledge needed for students' success.

Table 3: Features of Critical Academic Reading Skills

Skills/Subskills	Facione 1990	Haromi 2014	Choon et al. 2014	Teoh et al. 2015	Sari et al. 2019	Ariffin 2020	Edward et al. 2021
Accurate interpretation	√	√				√	
Assess the author's purpose/clarity.		√				√	
Identify the questions-et-issue/Precision.		√				√	
Identify essential concepts/depth.		√				√	
See significant implications/relevance.		√				√	
Identify, understand, and evaluate assumptions/logic.		√				√	
Recognise evidence, argument, and inference.	√	√		√			
Assess the credibility of an author.		√					
Grasp the point of view of the author.		√		√			
Empathetically reasons within the point of view of the author.		√					
Basic classification/Application.	√		√		√		
Bases for a decision/synthesis.	√		√		√		
Inference.	√			√	√		
Advanced classification/analysis.	√			√		√	
Supposition and integration/Evaluation.	√	√		√			
Developing vocabulary.	√	√	√				√
Recognising text organisation.					√		
Identifying topics and stated main ideas.			√				√
Constructing the implied main idea.					√		√
Classifying ideas in a text.					√		
Making inferences.					√		
Detecting assumptions.							
Synthesising reasoning.					√		
Determining purpose, audience, tone, and point of view.					√		

METHODOLOGY

The study aims to construct a comprehensive framework to foster critical reading skills among undergraduate students in Malaysia. To achieve this objective, the study employed a qualitative method using a comprehensive literature review (CLR) introduced by Onwuegbuzie and Frels (2016). The CLR

consists of seven steps, which are grouped into three phases: (1) Exploration Phase, (2) Interpretation Phase and (3) Communication Phase. There are seven steps involved: two steps in the Exploration Phase, three steps in the Interpretation Phase, and two steps in the Communication Phase. Figure 1 indicates the phases and steps in the CLR.
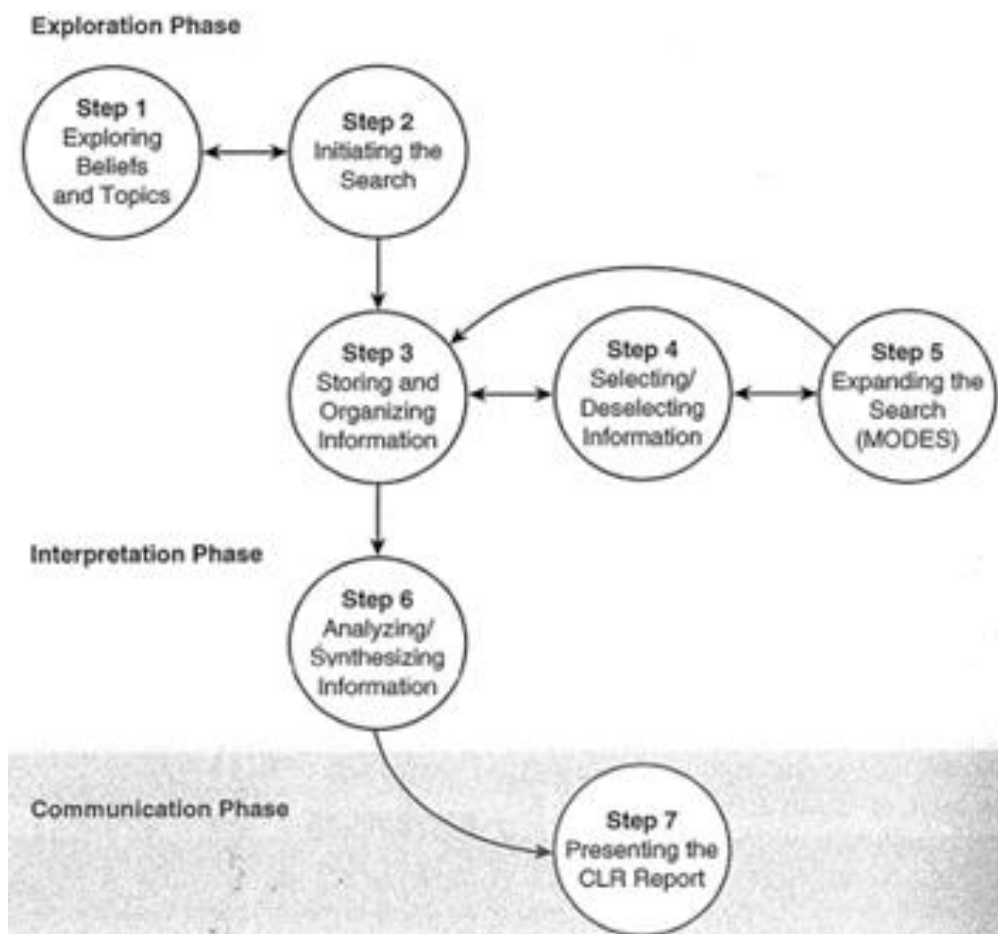

Figure 1: Steps in a comprehensive literature review (Onwuegbuzie & Frels, 2016)

A comprehensive literature review (CLR) was employed in this study to answer the first and second objectives of the study: (1) To identify the essential skills for undergraduate students to attain proficiency in critical reading and (2) to synthesize and compare existing literature regarding the skills and components required to develop critical reading skills among undergraduate students.

The research procedures followed in this study began with selecting the topic of critical academic reading skills for undergraduate students. A search for relevant articles was conducted using several databases: including the Education Resources Information Centre (ERIC), Scopus, Web of Science (WoS), and Google Scholar, with textbooks related to critical academic reading skills also selected. Keywords such as "critical reading," "undergraduate students," "skills," and "components" were used, with the search limited to journal articles and books published within the last ten years. All selected free-access journal articles were stored and organized digitally, while textbooks were stored in conventional form. The process of selecting and deselecting journal articles and textbooks was meticulous, based on their relevance to the research topic, pertinence to the research questions, and recency within the last ten years. The search was then expanded by seeking additional relevant journal articles and textbooks. Once selected, the articles and textbooks were analysed, and different types of information were synthesized to gather data relevant to the research questions. A report of the comprehensive literature review (CLR) is presented in the results section of this article. After completing the CLR, the findings were used to develop guidelines for creating a set of questionnaires aimed at measuring critical academic reading skills among undergraduate students in Malaysia.

FINDINGS AND DISCUSSION

The findings have gathered and demonstrated a wide range of critical academic reading skills needed by undergraduates. Several studies (Arifin, 2020; Choon, 2014; Edward et al., 2021; Facione, 1990; Haromi, 2014; Sari et al., 2019; Teoh, 2015) highlighted essential skills and subskills, as indicated in Table 3. They emphasised the crucial role of accurate interpretation, assessing the author's intent and clarity, articulating the question-at-issue, recognising key concepts, and discriminating major implications. These fundamental skills identified in a minimum of three studies (Arifin, 2020; Edward et al., 2021; Haromi, 2014) form the foundation of critical reading skills. Additionally, skills such as identifying evidence and arguments, making inferences, evaluating author credibility, and understanding the author's perspectives further enrich critical reading and enhance comprehension.

The rigorous and comprehensive literature review outcomes propose a framework consisting of seven crucial building blocks to develop the critical reading skills of Malaysian undergraduates. This framework includes essential skills and serves as a foundation for constructing a questionnaire to measure critical academic reading skills. Figure 2 groups critical reading skills into seven manageable and teachable blocks: 1) enhancing vocabulary and language understanding, 2) identifying main ideas and supporting details, 3) formulating topics and providing relevant evidence, 4) making inferences and identifying implied main ideas, 5) determining types of support and reasoning, 6) evaluating arguments and statements, and 7) conducting contextual analysis and detecting underlying assumptions.

Malaysian students learn critical academic reading skills as a course, and these seven steps serve as the underlying framework that could be used at the undergraduate level to assist educators and researchers in designing effective instructional methods, activities, and assessment tools for critical reading. This initiative is in line with Teoh et al. (2015), who recommended comprehensive critical reading instruction to be introduced at a higher education level to foster more profound and analytical reading capabilities.

The 7 Building Blocks of Critical Reading Framework for Questionnaire Development

Block 1: Enhancing Vocabulary and Language Understanding

Proficient reading begins with a solid grasp of language and vocabulary. To comprehend and engage with intricate academic texts, students need a rich vocabulary and strong language skills. Critical thinking relies on vocabulary and linguistic comprehension for analysis, evaluation, and synthesis. Commencing with language comprehension, this block aids students in deciphering unfamiliar terminology, sentences, and passages. Proficiency in vocabulary and comprehension skills is a significant predictor of academic performance, as supported by Crosson et al. (2019) and Dong et al. (2020).

Block 2: Identifying main ideas and supporting details.

Analysing supporting details enables students to extract essential ideas from a text. Critical thinking demands the ability to differentiate core concepts from supporting details, facilitating the retrieval of relevant information and the comprehensive analysis of texts. This second building block is centred on identifying the main concepts and supporting evidence, thus contributing to students' comprehension and academic achievement, as proven by Imam et al. (2014) and Bellaera et al. (2021). Proficiency in critical thinking is improved when students can accurately discern a text's central idea and its supportive elements, as noted by Nor and Sihes (2021).

Block 3: Formulating topics and providing relevant evidence.

In this section, students will create their own opinions about a text and present textual proof. It requires critical analysis and reasoning. This block promotes critical thinking through active reading and evidence-based argumentation. Topic formulation and evidence provision are essential for achieving academic writing

proficiency and higher grades. Adebisi (2022) highlights the importance of critical thinking in academic success, displaying the value of evidence-based reasoning in constructing solid academic arguments. Similarly, Saeed et al. (2021) emphasise that students who can effectively formulate topics and back them with relevant evidence are more likely to excel in academic writing. Thus, being able to formulate topics and provide relevant evidence are essential components of critical reading skills, enabling students to construct strong academic arguments and achieve higher grades.

Block 4: Making inferences and identifying implied main ideas.

This section addresses skills of making inferences and identifying implied main ideas. Implied main ideas refer to the underlying themes or messages embedded in a text. These skills enable students to "read between the lines," establish connections between concepts and make predictions or hypotheses about textual elements. Academic success necessitates proficiency in the fourth building block, as highlighted by Eason et al. (2012) and Best et al. (2005). In addition to this, Mar et al. (2021), conducted a meta-analysis which found that narrative texts were better understood and recalled than expository texts, suggesting that inferential skills may be particularly crucial for comprehending expository academic material. These findings show the important role of inferential skills and identifying implied main ideas in critical academic reading, especially for complex expository texts found in educational contexts.

Block 5: Determine Types of Support and Reasoning

This block entails the identification and evaluation of a text's supporting arguments and rationale, involving the detection of logical fallacies or the distinction between facts and opinions. Developing critical readers who can assess textual arguments and evidence is pivotal for critical thinking, as it necessitates the ability to discriminate objective truths from subjective judgments, spot logical fallacies, and evaluate the arguments and evidence presented in the text.

According to LaRusso et al. (2016), academic language, perspective-taking, and complex reasoning can significantly impact deep reading comprehension. Furthermore, Soiferman (2010) emphasised the importance of comparing inductive and deductive research methods. This is because those who can identify the different forms of evidence employed by authors to bolster their claims and ideas are better equipped to evaluate intellectual arguments and discriminate whether the author's reasoning is inductive or deductive. As asserted by Barnett and Davies (2015) and Shanahan (2015), students who can recognise implicit assumptions, categorise ideas, and draw logical inferences from available information are better equipped to analyse and evaluate complex texts. Furthermore, students can establish connections between concepts.

Block 6: Evaluating Arguments and Statements

This critical skill involves evaluating textual content (Velayati et al. 2017), and it requires the analytical examination of opinions. Critical thinking encourages students to formulate their viewpoints and critically appraise those of others (Velayati et al., 2017). The sixth component, which focuses on assessing arguments and statements, plays a crucial role in fostering students' critical thinking skills, as explained by Paul and Elder (2013). According to Velayati et al. (2017), students who can analyse evidence and formulate their judgments exhibit enhanced critical thinking and reasoning skills.

Block 7: Conducting Contextual Analysis and Detecting Underlying Assumptions

This block underscores the importance of contextual analysis and the identification of implicit assumptions within a text. It entails a meticulous exploration of a text's contextual factors and the detection of unspoken presumptions. Understanding a text's cultural, social, or historical context enhances comprehension. Identifying implicit assumptions aids in text interpretation. This method equips students with the ability to grasp the materials and question the implicit assumptions underlying a text. As asserted by Barnett and Davies (2015) and Shanahan (2015), students who can recognise implicit assumptions, categorise ideas, and

draw logical inferences from available information are better equipped to analyse and evaluate complex texts. Furthermore, students can establish connections between concepts.
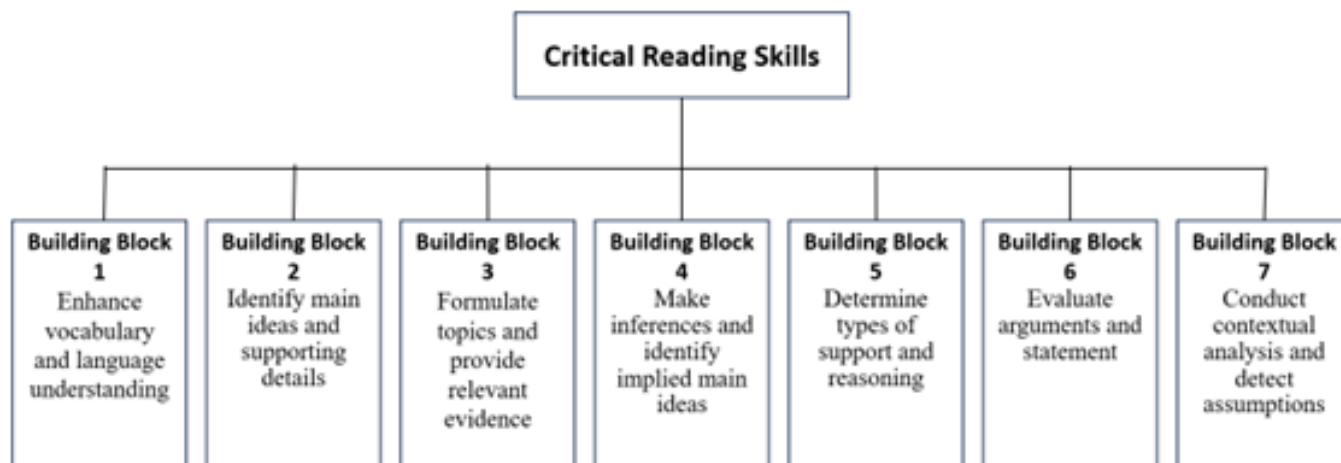

Figure 2. The 7 Building Blocks of Critical Reading Framework for Questionnaire Development

Questionnaire Items Developed based on the Seven Building Blocks

Collectively, these seven building blocks (Figure 2) offer a comprehensive framework for crafting a set of questions designed to measure critical academic reading skills among Malaysian undergraduate students. Each block represents a fundamental facet of critical reading expertise, contributing to creating effective assessment questions. These seven building blocks align with Teoh et al.'s (2015) comprehensive and inclusive approach to instructing critical reading. Table 4 presents a collection of questionnaire items developed based on the seven building blocks proposed in this study.

Table 4: Questionnaire Items for Assessing Undergraduate Critical Reading Skills.

Blocks/subskills	Questionnaire Items
1. Enhancing Vocabulary and Language Understanding	I. I am confident in my ability to interpret the meaning of unfamiliar words. II. I can understand the meaning of words and phrases based on the context of the text. III. I can accurately determine the intended meaning of a sentence or passage.
2. Identifying Main Ideas and supporting details	I. I can identify the stated main idea of a paragraph with ease. II. I can accurately identify the major supporting details of a paragraph. III. I can accurately identify minor supporting details of a paragraph.
3. Formulating Topic and Providing Relevant Evidence	I. I am confident in my ability to formulate a suitable topic for a given paragraph. II. I can provide relevant evidence to support the topic of a paragraph.
4. Making Inferences and Identifying Implied Main Ideas	I. I can make inferences based on statements in a text. II. I can provide relevant evidence to support my inferences. III. I am confident in my ability to identify the implied main ideas of a paragraph.

5. Determine Types of Support and Reasoning	I. I can determine the types of support the author uses to support an idea. II. I can provide an example of the different types of support used by the author. III. I am confident in identifying whether the author uses inductive or deductive reasoning.
6. Evaluating Arguments and Statements	I. I can determine whether a statement about the article is true or false. II. I can provide my own opinion on the issue being discussed in the article. III. I am confident in my ability to evaluate the author's arguments and determine validity.
7. Conducting Contextual Analysis and Detecting Assumptions	I. I can detect assumptions made in a certain paragraph. II. I can effectively classify ideas in a text. III. I can draw conclusions based on the information presented in a text.

There are sets of questions assigned to each block. These questions are used to assess students' critical reading competencies. Vocabulary and language comprehension questions can test students' capacity to understand complex academic materials and participate in advanced debates. Questions about identifying main ideas and supporting details can assess students' textual analysis skills. Students' ability to formulate the topic of a text and provide evidence can also be assessed through topic and evidence questions. Inference and implied main idea questions can help assess students' ability to reason the textual information. Questions about evidence forms and reasoning can assess students' ability to find evidence in a text. Evaluation-related questions can examine students' ability to evaluate text claims critically. Finally, contextual analysis and assumption detection inquiries can assess students' ability to analyse a text's context and identify assumptions.

CONCLUSIONS AND RECOMMENDATIONS

Through a comprehensive literature review, a framework has been constructed to enhance the critical reading skills of undergraduate students. This study has identified seven essential critical reading skills: 1) enhancing vocabulary and language understanding, 2) identifying main ideas and supporting details, 3) formulating topics and providing relevant evidence, 4) making inferences and identifying implied main ideas, 5) determining types of support and logical reasoning, 6) evaluating arguments and statements for validity and reliability, and 7) conducting contextual analysis and detecting underlying assumptions. It is evident from this research that critical reading demands a diverse set of skills that can be enhanced through practise and perseverance. This investigation has the potential to enhance both critical reading skills and assessment tools for educators and scholars. The methodology and research questions of this study establish a solid foundation for future research on critical reading among undergraduates. Teaching undergraduate students critical reading from multiple perspectives can strengthen the proposed critical reading skills framework, benefiting educators and students.

The findings of this study could offer a significant contribution to the enhancement of approaches designed to develop critical reading skills among undergraduates in Malaysia. The proposed framework exhibits potential as a valuable instrument for formulating pedagogical strategies intended to enhance student's abilities to read critically. Consequently, utilising the framework is likely to generate favourable results regarding students' academic accomplishments and future career aspirations. The findings of this study will be shared through an academic publication to provide valuable insights to policymakers, educators, and researchers on the significance of critical reading skills. Moreover, the research aims to highlight the significance of implementing effective methodologies to foster these skills among undergraduate students in Malaysia.

Building upon the findings of this study, it is advisable for future research to validate the proposed framework designed to enhance critical reading skills among undergraduates. Validating the framework is important to ensure it works as intended, validating the framework is essential to ensure it functions as intended and assists educators and researchers in designing effective instructional methods, activities, and assessment tools to enhance critical reading skills. Furthermore, there is a need for additional investigations to uncover potential cultural and language variations in critical reading skills. These research initiatives have the potential to illuminate the advantages of instructional interventions based on the framework. By conducting these studies, a more profound understanding of the framework's effectiveness can be attained, ultimately contributing to enhancing educational practises, assessment methods practise, and improved student outcomes.

ACKNOWLEDGEMENT

CONFLICT OF INTEREST

The authors declare no conflicts of interest. This study was conducted ethically and impartially, with all conclusions based solely on the data collected.

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