Reflective Minds, Brighter Futures: Empowering Critical Reflection with a Guided Instructional Model

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Abstract

Critical thinking is recognised as instrumental for positive, personal and professional, long-term outlooks. It is also widely accepted that the development of students' critical thinking skills can be achieved through explicit interventions. This paper documents the outcomes of a pilot study that investigated the value and impact of an instructional model for guiding critical thinking skills. The model was implemented as an explicit framework, with pre-tertiary students, at a regional campus of an Australian university. Student participants were tasked with using the Review, Connect, Extend, Apply (RCEA) Framework (James, 2015) to support their analysis and critical reflection on the concepts explored in a unit of study. Data revealed that students exhibited limited critical thinking skills prior to participation in the pilot program and evidenced improvement after engaging with the RCEA framework. However, some students struggled with expressing their reflections, evaluations, and applications of knowledge, which resulted in considerations about the importance of vocabulary. The findings directed the authors to note the importance of qualifying the notion of explicit interventions for teaching critical thinking. Accordingly, they propose the use of an explicit teaching model for enabling students' critical thinking, which encompasses a structured format, a thinking framework, and pedagogy that incorporates the modelling of metacognition and metalanguage for critical thinking.

Practitioner Notes

1. Critical thinking skills require explicit instruction and educators should prioritise the deliberate instruction of critical thinking skills and provide opportunities for students to apply these skills in diverse contexts.
2. The explicit teaching of critical thinking should include constructivist processes, explicit pedagogy, and the development of metalanguage.
3. For students to develop the skill of critical thinking, they students require a broader vocabulary repertoire to facilitate the application of terminology to cognitive processes.
4. When educators use an *explicit think-aloud approach,* it demonstrates and models what critical thinking looks like in action.
5. The Multifaceted Explicit Teaching Model presented endorses that critical thinking can be taught by combining a thinking framework, embedded within a structured format, and a pedagogical strategy of *explicit think−aloud* that facilitates exposure to the metacognition and metalanguage associated with critical thinking behaviours.

Introduction

An increased likelihood of success at university is positively associated with deep levels of understanding (Hilton & Hilton, 2017, p. 223), thus the gaining knowledge is valued highly in the higher education arena. Well known terminology such as higher-order thinking, deep thinking, metacognition, critical reflection and critical thinking are all terms for advanced levels of knowing. Kuhn and Udell (2001) call these tools of wisdom, which aligns to Costa's (2022) Habits of Mind whereby students are required to think critically in order to identify and evaluate multiple perspectives to help make an informed decision in their personal and professional lives. Hadley and Boon (2022) recognise that developing a critical thinking disposition affords higher levels of thinking and develops deeper levels of self-awareness through recognising personal biases and beliefs. A number of researchers (see Flores et al., 2012; Halpern, 1998) propose that a significant proportion of adults exhibit deficient critical thinking skills, which is further substantiated by Gelder's (2005) assertion that numerous individuals are deficient in fundamental reasoning abilities. The implication of this assumption is concerning for adult learners who enrol in university through pre-tertiary enabling courses, as these students frequently exhibit lower-levels of academic aptitude and often lack comprehension of the essence of critical thinking and its application in relevant contexts (Klinger & Tranter, 2009). Upon admission into undergraduate courses, students are required to critically engage with a considerable range of knowledge, involving analysis, synthesis, and evaluation of arguments. However, students who enter university through enabling pathways may lack the necessary higher-level thinking skills and academic rigor for such critical engagement (James, 2016). Despite being an implicit expectation for university students, critical thinking is not typically explicitly taught as an academic skillset.

Therefore, in order to help students prepare for the depth of thinking required for higher education and enhanced futures, Brownlee et al., (2009) suggests that it is important to focus on knowledge processes and not just a knowledge product. Supporting students to engage in deep, critical thinking is invaluable, not only for learning achievement but also for students' personal and professional futures beyond the confines of the classroom. The wisdom afforded through effective deep thinking empowers students to express their unique identities and thoughts, make decisions about what to believe and what to do, and create solutions and innovations (Lopez & Whittington, 2001, p. 22). This paper reports on the findings of a trial project introducing enabling students to a critical reflection journal to develop critically reflective skills, and thus critical thinking.

Literature Review

Enabling

The massification of higher education in Australia has impacted on the increase of the diversity of the student cohort (Huntly & Donovan, 2009). Returning to study can be an "anxiety-provoking" experience for many adults (Cranton, 2002, 2006), especially for students entering university through an enabling pathway as it may initiate feelings of fear, self-doubt and uncertainty as these students transition into a new, and for some, foreign, environment (Armstrong et al., 2018; James, 2016; Willans & Seary, 2007). Research within enabling courses has identified that the students who enter university through an enabling pathway often present with lower levels of academic skills, are diverse in age, come from culturally diverse backgrounds, have varying life experiences and often come from low socio-economic regions of society (Bennett et al., 2013; Bourke et al., 2016; Hodges et al., 2013). In addition, they may enter with lowered levels of confidence about their ability to handle academic study and have a fear of failing (Cullity, 2006; Klinger & Tranter, 2009; Willans & Seary, 2007, 2009). These students generally do not have the higher-level thinking skills or academic rigour to enter into undergraduate studies without first completing an enabling skills course. As Hooks (2010) suggests, when students face difficulties in the cognitive domain of academia, it may be attributable to their inadequate comprehension of how to employ critical thinking skills in their studies, resulting in a probable sense of disappointment in their subpar grades.

Critical Thinking

Critical thinking can be simply defined as the capacity to impartially analyse information to make sound judgments. However, Willingham (2008, p. 8) provides a definition for the extent of critical thinking required at the university level of education, stating that it is "seeing both sides of an issue, being open to new evidence that disconfirms your ideas, reasoning dispassionately, demanding that claims be backed by evidence, deducing and inferring conclusions from available facts, solving problems." According to research, this process incorporates a combination of cognitive abilities, competencies, and attitudes. Nonetheless, researchers working in the field of critical thinking acknowledge that the capability to think critically is separate from the inclination to engage in such thinking (Ennis, 1985; Facione et al., 2000). Lai (2011, p. 11) posits that dispositions, in the context of students, can be reflected in their attitudes or cognitive habits. These may include a propensity to seek logical reasoning, a desire to be well-informed, and an attitude of respect and openness towards different perspectives. Such attributes demonstrate the student's inclination towards critical thinking. The disposition to think critically has been defined by Facione et al., (2000, p. 64) as the "consistent internal motivation to engage problems and make decisions by using critical thinking." Thus, student motivation is viewed as a necessary precondition for critical thinking skills and abilities. In support of this, Halpern (1998) argues that effort and persistence are two of the principal dispositions that support critical thinking and Paul (1992) maintains that perseverance is one of the "traits of mind" that renders someone a critical thinker (p. 13). Therefore, it is intimated that motivated individuals are more likely to exhibit critical thinking.

Researchers within the field of critical thinking suggest that it is a form of metacognition (Lumpkin, 2020; Rivas et al., 2022). Metacognition has been defined most simply as thinking about thinking (Chick, 2013). Flavell (1979) argues that "critical appraisal of message source, quality of appeal, and probable consequences needed to cope with these inputs sensibly" can lead to "wise and thoughtful life decisions" (p. 910). Therefore, he suggests that this link to critical thinking is a valuable life skill. Gelder (2005) and Willingham (2008) both argue that a component of critical thinking is the ability to deploy the right strategies and skills at the right time. This is often referred to as conditional or strategic knowledge and also considered part of the construct of metacognition (Kuhn & Udell, 2001; Rivas et al., 2022; Schraw et al., 2006). Leicester (2010) and Halonen (1995) identify metacognition as the ability to monitor the quality of critical thinking. Therefore, metacognition can be seen as a supporting condition for critical thinking in that monitoring the quality of one's thought makes it more likely that one will engage in high-quality thinking (Lai, 2011). Thus, like motivation, metacognition appears to be a supporting condition for critical thinking.

However, many researchers have noted that critical thinking skills and abilities are unlikely to develop in the absence of explicit instruction (Abrami et al., 2008; Facione et al., 2000; Halpern, 1998; Paul, 1992). In the context of education, critical thinking is an essential skill that students must learn and apply to various aspects of their lives. According to Lai (2011), educators play a crucial role in providing explicit instruction in critical thinking, which involves teaching students to analyse, evaluate, and synthesise information to make informed decisions. Furthermore, Lai (2011) emphasises that the transfer of critical thinking skills to new contexts is equally important. Students must learn how to apply these skills beyond the classroom setting, such as in their personal and professional lives. Additionally, she suggests teaching approaches such as cooperative, or collaborative learning methods, and constructivist approaches that differentiate learning and place students at the centre of the learning process are vital in developing critical thinking skills (Lai, 2011). This is further supported by Rivas et al., (2022) who purport that problem-based learning is a useful approach to developing these skills in higher education.

A significant body of research indicates that critical thinking skills and abilities are able to be taught. Abrami et al., (2008) and Orhan and Çeviker Ay (2023) argue that interventions aimed at developing critical thinking skills have a positive impact. Van Gelder (2005) advocates for a focused approach to critical thinking instruction, asserting that students need deliberate practise in exercising these skills. Critical thinking can be effectively nurtured when it is explicitly taught as a distinct component of the curriculum and integrated seamlessly into the process of learning the subject matter (Case, 2005; Lai, 2011). Research also suggests that students must be taught to transfer their critical thinking skills to a variety of contexts, by providing them with opportunities to apply these skills in unfamiliar circumstances (Lai, 2011). However, some scholars argue that instruction in critical thinking must be integrated with instruction in basic core academic skills (Orhan & Çeviker Ay, 2023). Behar-Horenstein and Niu (2011) concur with this view, affirming that knowledge and thinking must be taught explicitly and concurrently. In an analysis of 117 empirical studies on the effects of instructional interventions, Abrami et al. (2008) suggest that educators should approach critical thinking instruction by combining the teaching of general critical thinking skills as a stand-alone component with the integration of these skills into regular academic content. Overall, Lai (2011) argues that these findings reinforce the importance of

providing explicit instruction in critical thinking, rather than expecting students to understand the implicit expectation that critical thinking is a metacognitive skill. In maintaining awareness of the heterogenic nature of students, it is important to distinguish that explicit instruction refers to the precision utilised in teaching the skills and not the presentation of a standardised way of thinking. Therefore, educators should prioritise the deliberate instruction of varied critical thinking skills and provide opportunities for students to apply these skills in diverse contexts.

Critical Reflection

Critical reflection is a pivotal element of critical thinking, as it triggers learners to integrate new knowledge and information into their personal experiences, thereby enhancing their awareness of their own learning (Howlett et al., 2016). This process involves learners forming judgments, reaching conclusions, and applying a personalised lens that mirrors the fundamental principles of critical thinking. By viewing new information through this lens, learners gain a deeper understanding of how to apply it to real-world situations, thereby facilitating greater insights into their own learning process. John Dewey, a prominent educational theorist and widely regarded as the founding father of reflection in adult education, considers reflective thinking as a crucial element of learning (Lundgren & Poell, 2016). Lundgren and Poell (2016, p. 4) define reflection as "the process of exploring or examining a matter of concern and considering it in relation to personal experiences." Critical reflection, as defined by Lundgren and Poell (2016), represents the highest level of reflection. As such, critical reflection can be described as the "process of analyzing [sic], reconsidering, and questioning experiences within a broad context of issues" (Murray & Kujundzic, 2005). Boud, Keogh, and Walker's (1985, p. 16, as cited in Lundgren & Poell, 2016) pragmatic description of reflection further enhances its meaning. They describe reflection as activities where individuals re-evaluate their experiences to gain a new appreciation and empathy for them. Therefore, critical reflection is a vital component of learning that involves thoughtful examination and analysis of personal experiences, leading to a greater understanding of one's own learning process.

What is the Problem Area?

Lai (2011) posits that even though critical thinking can be taught to everyone; most adults demonstrate a lack of reasoning skills. Halpern (1998) concurs with this, stating that many adults fail to think critically in many situations. Similarly, Kennedy et al., (1991) and van Gelder (2005) have observed that a considerable number of adults lack fundamental reasoning abilities. In fact, Lai (2011) claims that the general public often views personal experience as more persuasive than a scientific study that has been carefully conducted. Consequently, given the tendency towards deficient reasoning, Halpern cautions that instructional interventions need to be implemented slowly and incrementally (1998). Yet, despite the evidence suggesting that the average person struggles to think critically, many critical thinking researchers believe that with appropriate instruction, people can become critical thinkers. For instance, Kennedy et al. (1991) assert that critical thinking instruction can benefit students of all intellectual ability levels and are essential for everyone, not just the gifted. They believe that the lack of basic reasoning skills in individuals could be due to deficient educational experiences during their developmental years. Supporting this notion, Paul (1992) posits that conventional school instruction does not foster the

development of higher order thinking skills such as critical thinking. As a result, students entering university, through an enabling pathway, face the additional challenge of learning how to think critically and applying this to their higher education journey.

Reflective Journaling

Hubbs and Brand (2005) assert that reflective journaling has the potential to provide educators with an insight into the cognitive processes of their students, and acts as a means for students to explore, interrogate, and interact with the content, concepts, ideas, values, beliefs, and emotions associated with a given project. As a result, educators can use these journals to evaluate the students' reactions and provide feedback that aligns with the intended learning outcomes. It is recommended that prior to introducing reflective journaling, educators initiate an open dialogue with students that emphasises the purpose of the activity and highlights the importance of critical thinking. Kerka (1996) emphasises the need for three conditions to be fulfilled for reflection to be successful: (a) the reader of the journal must be perceived as trustworthy; (b) the expectations must be clear; and (c) the feedback provided must be of high quality. However, feedback must be delivered with care to prevent students from feeling judged or intimidated (Anders, 2002). Furthermore, Bailin (2002) cautions that students may simply perform the steps of critical thinking without engaging in critical thought.

Method

This paper builds on a previous paper that disseminated the findings of a pre-entry survey undertaken by students. The paper titled What is critical thinking? Pre-commencement perceptions of enabling students entering into university studies (Armstrong & James, 2018) foregrounded the context of critical thinking by investigating enabling students' perceptions of what it means to be a critical thinker and then evaluated their actual ability to critically respond to a series of questions. The initial findings indicated that, although the participants demonstrated a basic understanding around critical thinking, there was still room for further development in the application of these thinking skills. The next phase of this research entailed a pilot project where participants completed critical reflection journals and shared their thoughts of the experience in a post survey.

Project Overview

The critical reflection journal (CRJ) was developed using the Review, Connect, Extend, Apply (RCEA) framework developed by James (2015). Initially developed as an approach for educators to follow to ensure adult learning principles and brain-based learning principles were being actioned within their andragogical teaching practice, it was recognised that the RCEA framework may also be effective as a 4-step approach to critical thinking. The research team, comprising of four academics, wanted to investigate whether this approach would help develop a student's ability to critically reflect on content being taught and whether it developed their meta-cognitive ability, aptitude for critical thinking and repertoire of critical language. A pilot study was developed to trial this approach and investigate its validity through the creation of a reflective journal where students could reflect weekly on content being learnt. The unit Preparation Skills for University

(PSU) within the Skills for Tertiary Education Preparatory Studies (STEPS) course was chosen as the site to conduct this research as it teaches students critical study habits that are required at university.
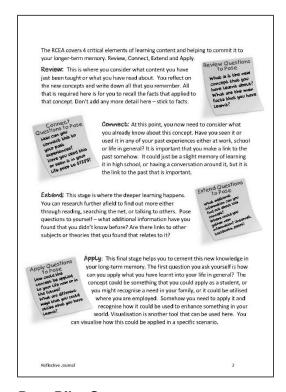
Data

Reflective Journal

Students who agreed to be a part of the trial were given a hardcopy journal for weekly reflection on the content taught. The process of reflecting using the RCEA approach was explained in detail by the chief investigator and participants did a practice reflection on their orientation experience. The participants were asked to reflect weekly and at the end of the term, the journal was collected, scanned for analysis and returned to the participant to keep. The journal introduced participants to the four step RCEA critical thinking process and they were asked to use this approach to reflect on the weekly content (see figure 1).

Figure 1:

Example critical thinking journal page

Post Pilot Survey

A survey was sent out to all students on completion of the term. Participants were asked both qualitative and quantitative questions to capture their view on their personal experiences using the reflective journal during their time studying in PSU.
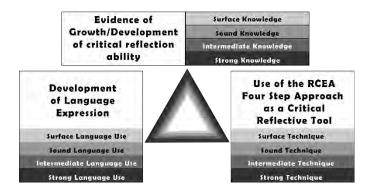
Data Analysis

The analysis strategy employed for this project required two researchers to individually critique each journal using a triangulation approach (see figure 2) which investigated:

1. The development of critical reflection skills,
2. Language expression used and
3. The RCEA approach as an instructional design.

The journal was analysed using two forms of analysis: Intercoder Reliability and Framework Analysis.

Figure 2:

Triangulation

Intercoder Reliability

Firstly, in order to qualify and evaluate the standard of the journal entries, Intercoder Reliability was utilised to interpret the participants' reflective journals and draw conclusions. Intercoder Reliability is defined by Lombard et al., (2002, p. 589) as the "extent to which independent coders evaluate a characteristic of a message and reach the same conclusion". Tinsley and Weiss (2000, p. 98) qualify this definition by explaining that Intercoder Reliability refers to the degree of agreement arrived at by different researchers. Hartas (2010) suggests that this technique is suitable when subjective opinions will be used to rate segments of data because it produces a level of objectivity in relation to the results. The coders' conclusions, against three criteria, were triangulated.

Framework Analysis

Framework Analysis was then implemented to provide a systematic approach to making meaning of the data (Ritchie & Spencer, 1994). Framework Analysis is a qualitative data analysis methodology, which encompasses five phases including: familiarisation, construction of thematic framework, indexing, charting and mapping and interpretation (Ritchie & Spencer, 1994, p. 178). The initial stage of familiarisation involved deep engagement with the data sourced from the

investigation in order to gain a thorough understanding of the data. This immersion facilitated opportunities to identify salient themes, notions and issues within the dataset. The RCEA framework was used as the key construct to deductively derive themes. A cross-sectional analysis using the triangulation categories was used to index and catalogue the data. The indexed data was transferred into a chart which reflected the truncated data and supported pattern exposure. The final stage of mapping and interpretation using the Framework Analysis approach culminated the process through drawing conclusions and insights from the charted data (Moss, 2020).

The overarching research question that underpinned this study was "how effective was the self-reflection guided instructional model in developing each participant's depth of reflecting critically and applying critical thinking skills?" with a sub-question of "how has the student's level of critical reflection developed over the term?". Firstly, the analysis considered the development of the participants' critical reflection skills and considered how participants defined, questioned and interacted with the content. Secondly, it considered how the language had developed to reflect critical thinking language discourse. Finally, it considered how the participants comprehended and used the four stages of RCEA to develop their knowledge and interact critically with the content.

Criteria for Data Analysis

for each element of the triangulation was used to grade against and these ranged from surface knowledge, sound knowledge, intermediate knowledge and strong knowledge (see Table 1). In order to ensure higher levels of reliability, the researchers discussed their placement on the criteria and a consensus was made where both parties agreed.

Table 1

Criteria for analysing journals

Evidence of growth/development of critical reflection ability			
Surface Knowledge	Sound Knowledge	Intermediate Knowledge	Strong Knowledge
The student describes, reports or retells with minimum depth	The student uses source data in some way,	The student identifies aspects of the data which have personal meaning or which connect with their prior or current experience.	The student integrates the data into an appropriate relationship involving a high level of transformation and conceptualisation and seeks deep understanding of why something has happened exploring the relationship of theory and practice in some depth.

No added observations or insights	Low level depth or understanding.	The student gives superficial explanation of the reason why something has happened or identifies something that they need or plan to do, or change.	Content indicates synthesis of ideas, in-depth analysis and evidences original thought and support.
Shows some thinking and reasoning	Content indicates thinking and reasoning applied with original thought on a few ideas.	Content indicates original thinking and develops ideas with sufficient and firm evidence.	Main points are well developed with high quality expression.
Most ideas are underdeveloped and unoriginal	Some critical thinking is present.	Main points well developed with quality supporting details and quantity. Critical thinking is woven into points.	Reveals a high degree of critical thinking.

Use of the RCEA four step approach as a critical reflective tool

Surface Technique	Sound Technique	Intermediate Technique	Strong Technique
The student describes, reports or retells with minimum depth	The student addresses each step of the RCEA approach.	The student demonstrates an understanding of the progressive nature of the RCEA approach addressing each step.	The student demonstrates a strong understanding of the progressive nature of the RCEA approach with each step clearly addressed.
No added observations or insights that addresses the RCEA approach.	Student echoes content learnt, shows minimal link to prior experiences, makes connection to some ideas and attempts to apply it to life.	Student reflects on content learnt, shows links to prior experiences, makes connection to similar ideas and applies it to life.	Student reflects deeply on content learnt, identifies links to prior experiences, sources additional readings and effectively applies it to life.

Shows some thinking and reasoning	Main points are reasonably developed.	Main points are well developed with good expression.	Main points are well developed with high quality expression.
Most ideas are underdeveloped and unoriginal.	Critical reflection is lacking.	Critical reflection is evident.	Reveals a high degree of critical reflection.

Development of Language Expression

Surface Language Use	Sound Language Use	Intermediate Language Use	Strong Language Use
Writing lacks detail.	Writing is coherent and somewhat organised.	Writing is coherent and logically organised .	Writing shows high degree of attention to logic and reasoning of points.
It shows some coherence but ideas lack unity.	Some points are misplaced and stray from the topic.	Overall unity of ideas is present that demonstrates understanding of content.	Unity clearly leads the reader to the conclusion and stirs thought regarding understanding of content.
Little or no critical language or rhetorical devices used.	Main points are present with limited detail and development.	Critical language and rhetorical devices used effectively.	Shows above average use of critical language.
	Some critical language is used.		Uses rhetorical devices and tone effectively.

Participants

This research delves into the subjective experiences of the individual participant in order to give voice to their actual experience as they develop critical thinking skills through a structured approach to critical reflection. A small sample of students were recruited who were enrolled in the Preparation Skills for University unit in the STEPS course at the Mackay Campus of CQUniversity. A total of 30 students expressed an interest in being involved in the project, of these, 22 came to an information session and 14 signed up to receive the journal. A total of 8 completed the term but only 4 returned their journals for analysis.

Findings

Intercoder Reliability

The results of the analysis using Intercoder Reliability were varied among the participants. The data suggested that participants who scored higher had invested more time in reflecting, which had led to an improved understanding of the content being taught. Participant 1 exhibited a high level of dedication to the journaling process and received a high grade based on the established criteria. This participant initially handwrote their entries, but later switched to typing them in a word document as it was their preferred method. Participants 2 and 4 continued to use the hard copy, but their responses varied in quality, with some being rushed and others showing depth. Participant 2 found the Review and Connect elements of the reflection process to be easy but did not extend their understanding or apply it to life as per the RCEA approach. Participant 4's responses were mixed, with a lack of understanding of the extend element as it was more of a critique of the module than an extension of the topic. Participant 3's attempt was limited and appeared rushed, with numerous grammatical errors. Furthermore, instead of following the reflection process, this participant copied the learning outcomes at the start of each module. Table 2 provides an overview of the overall grading and reflection scores for each participant.

Table 2

Overall grading and reflection

Participant	Evidence of growth in critical thinking ability	Development of language expression	Use of the RCEA as a critical reflective tool
Participant 1	Intermediate	Intermediate	Strong

Analysts' comments: Participant showed high levels of commitment to this task. Growth in knowledge acquisition and ability to use this RCEA approach reflects that this journal was beneficial in skill enhancement

Participant 2	Sound	Sound	Surface

Analysts' comments: Participant showed a mixed effort in completing the journal. Being handwritten, there were a lot of grammatical errors and at times challenging to read. Strength was shown in the Review and Connect sections but Extend and Apply were very basic.

Participant 3	Surface	Surface	Surface

Analysts' comments: Participant showed minimal effort in completing the journal. Mostly dot points were used and the review reflections are copied from the learning objectives in the study guide. Seemed to be very rushed.

Participant 4	Sound	Sound	Sound

Analysts' comments: Participant showed a mixed effort in completing the journal. Some responses very brief with one blank reflection. Whilst RCEA is attempted, the Extend process was more a critique of the module than an extension of the topic.

Key			
Surface	Sound	Intermediate	Strong

Contextualising Findings Within an Enabling Context

This study was situated within the discourse of an enabling course, which is designed to provide academic support for students who enter with lower levels of cultural capital and who may have been out of the educational context for many years or have had negative experiences with education in the past (Bunn et al., 2020). As a result, these students may feel uncertain about their position within higher education and may have yet to define their identity as a student (Bunn et al., 2020; Hattam & Bilic, 2019; Willans, 2010). Furthermore, their academic capacity is yet to be determined, and they are often challenged to adopt a more critical perspective as their world views are expanded (Willans & Seary, 2007, 2009). It is important to note that these students may also present with lower levels of academic writing and reading proficiency, which may impact their ability to effectively communicate their thoughts through writing (Priest, 2009).

Development of Critical Reflection Skills

The first aspect analysed was the development of the participants' critical reflection skills. The majority of the participants displayed limited experience with critical thinking prior to the trial (Armstrong & James, 2018). However, it was observed that the participants demonstrated growth in critical thinking skills as they engaged in the trial. Notably, the participants' personal literacy and proficiency in the written language seemed to impact the level of critical thinking conveyed, and thus, this factor was deemed relevant to consider in the analysis.

The analysis of the reflective journals highlighted the key areas of critical thinking that had developed throughout the implementation of the initiative. Table 3 depicts the interactions that occurred within each phase of the RCEA approach. The verbs used in each stage align with the goal of that phase, and the analysis revealed that participants exhibited growth in their critical thinking skills throughout the pilot initiative. During the reviewing phase, participants described, explained, identified, and demonstrated their understanding of the core concepts being taught. In the connecting phase, they made connections, compared, provided reasons, and made personal

connections. When extending their knowledge, participants constructed deeper understanding, explained new information, and evaluated its usefulness. Finally, in the applying phase, participants recognised how they could apply the new knowledge to life circumstances in the present and future, visualised how it could be applied in a specific scenario, and explained the benefits of applying it. The effective enactment of each phase's key assumptions by the participants, was demonstrated by the findings. However, the depth of critical thinking communicated by each participant was affected by their personal literacy and application of written language. The next section will provide a deeper reflection on the analysis of responses to the individual phases of the RCEA approach.

Table 3:

Analysis of participant's critical reflection interactions

Analysis Journal - RCEA	REVIEW	CONNECT	EXTEND	APPLY
Consider how students have comprehended and used the four stages of RCEA to develop their knowledge.	• Describes the main ideas • Explains the facts that relate to the main ideas • Establishes the foundations of concepts • Breaks down the key components of the ideas • Demonstrates understanding of the difference between listing what was taught and explaining what was understood. • Identifies areas needing further clarification	• Reflects on the concepts learnt in the Review stage • Makes a connection based on prior knowledge or past experience • Evaluates the value of the prior knowledge • Compares prior knowledge to new information • Provides reasons for the past experience based on new knowledge • Makes personal reflections based on their new understanding	• Identifies areas requiring further clarification through the previous stages. • Constructs deeper knowledge through peer interaction • Identifies where to source additional information • Identifies the type of information that would be found in specific source • Researches to find additional information to gain deeper understanding. • Explains the new knowledge they discovered through research • Evaluates the usefulness and validity of the source and compares several sources • Finds links to other subjects or theories that relates to the concepts.	• Describes the personal implications of the new understandings gained in the Review, Connect and Extend stages. • Applies the understanding to general life in the student's present or the future. • Applies the knowledge in different ways- as a student, a family need, place of employment • Visualises how this could be applied in a specific scenario • Explains "how" to apply the new information • Explains the benefits of applying the new information.

Review

The initial phase of the RCEA approach, i.e., the Review phase, involves the participants reading and analysing the content being taught to establish a fundamental understanding (James, 2015). The journals analysed in this study revealed a marked improvement in the participants' engagement with the course material. Specifically, one participant described the main ideas relating to the primary concepts and included additional information relating to those concepts. Whereas, another participant went into greater depth and detail, including explanatory facts and logical reasoning to support their understanding of the course material. This student demonstrated a thorough comprehension of the concepts taught, thereby exhibiting the purpose of the Review stage.

Connect

The Connect stage necessitates participants to connect the content being taught to their prior experiences in life (James, 2015). The reflective journals indicated that the participants were successful in achieving this aim. For instance, one participant compared their previous work experience to the current learning by describing their former workplace and connecting the new concepts to that period in their life. Another participant evaluated their past experience and remarked that they had no clear goals at the time. Similarly, a participant started with a personal reflection and then proceeded to link the content learned in the Review stage to the personal

implications of those experiences. In another instance, a participant briefly referred to a previous module and explained how that learning had been beneficial. Overall, the reflective journals revealed that the participants were effectively connecting the new learning to their prior life experiences.

Extend

The Extend phase of the RCEA involves students engaging in research to deepen their personal understanding of the concepts being taught (James, 2015). While some participants put forth a limited effort in this phase, one student exhibited a high level of critical thinking skills. Despite initially feeling overwhelmed by the workload, the participant demonstrated a comprehensive understanding of the benefits of this stage in discovering new questions and information to gain a more in-depth view of the subject matter. They also emphasised the importance of being discerning in the information gathered. Another participant identified an area requiring further clarification and used it to guide their research to extend their knowledge. The participant evaluated the usefulness of the source and clearly explained the new knowledge gained. In another case, a participant provided examples of interesting information discovered during their research and evaluated the credibility of the source by examining the author's credentials. Overall, the responses to the Extend phase demonstrated varying levels of effort and critical thinking skills among participants.

Apply

The final phase of the RCEA approach involves the application of the knowledge gained to real-life situations (James, 2015). The journals showed that the participants were able to apply what they learned. One participant made a direct link between the knowledge gained during the Extend phase and their future career choice. This participant weighed various options and gave clear reasoning for their response. Another participant applied the knowledge gained to build resilience by making a specific life choice. They explained how this choice would build resilience and how they intend to be self-reflective for continued improvement in this area. Another participant applied the concept of critical thinking and their additional research specifically to evaluate source material and to life in general to "find deeper meaning." One participant provided a general overview stating their attitude would be one of continual reflection. It was evident that the participants applied the knowledge gained, from engaging with the RCEA framework, to real-life situations.

Language Development

The second phase of analysis aimed to examine the development of participants' language and their use of terms and phrases that reflect the development of a critical thinking discourse. The results of the analysis indicated that there was an overall increase in the use of critical language over the course of the pilot program. However, it was noted that the language of reflection, evaluation, and synthesis was relatively limited, as well as the use of metalanguage.

When examining the different phases of the RCEA, it is apparent that language conventions and causal phrases indicate growth and appropriate language use in an enabling educational environment. Table 4 displays the language conventions utilised in the reflective journals to

demonstrate how language was applied during each stage. In the Review stage, participants employed words and phrases that emphasised and represented the content they had read, including "I have learned" and "I understand". During the Connect phase, language conventions were employed to demonstrate how students were connecting this knowledge to past experiences, such as "this reminds me" or "this is relevant to". When students progressed to the Extend phase, they experimented with language conventions commensurate with the discourse of critical thinking, including "evidence", "insightful", "valid", and "theories". Finally, in the Apply phase, the language conventions reflected a future orientation, with terms such as "future", "visualise", "benefit", "change", "improve", and "opportunity". Overall, the use of appropriate language conventions within each phase of the RCEA framework suggests that the participants were developing a critical thinking discourse and becoming more proficient in expressing their reflections, evaluations, and applications of knowledge gained through the reflective process.

Table 4:

Language Conventions

RCEA Phases	Words and phrases that foregrounded and aligned content
Review	I have learnt, concept, I understand that, facts, meaning, definition, content, processes, purpose, knowing how to.
Connect	I now understand, this reminds me, if, because, the reason I, my perceptions were, I can relate to, I connect to this, relevant to
Extend	Relates, useful, how to, links to, evidence, similar, insightful, credible, viewpoint, resources, informs, information, valid, credentials, theories, strategies
Apply	Future, change, help, utilise, visualise, benefit, change, improve, opportunity, choice, growth, reflect, problem solve

The analysis of the post-survey revealed that the participants had developed their ability to utilise appropriate language to express their deeper understanding. The participants demonstrated the use of critical language, such as "deeper analysis", "questioning data", "origin of information", "looking for bias and balanced arguments", "analyse data further", "broader view on concepts", "critical tools to consider every angle presented", "looking in-depth", and "not trustworthy or credible". Thus, it can be concluded that the language conventions used by the participants were appropriate for each phase of the RCEA within the context of an enabling course.

Value of RCEA as a Critical Reflection Tool

Finally, the participants' comprehension and utilisation of the four stages of the RCEA framework to enhance their critical thinking abilities were examined. The post-survey responses of the participants revealed a highly positive perception of their progress in critical thinking during the project. For instance, a participant stated that the program "provided me with the tools to consider every angle of information to form better assessments." Another participant recognised the importance of assessing the origin of information and seeking balanced arguments to avoid bias.

During the survey, participants were requested to evaluate the effectiveness of the RCEA reflection model as an instructional guide for learning how to reflect and critique the provided information. Out of the eight responses, two of them rated it as highly effective, while the remaining six participants rated it as effective (refer to Figure 3). Additionally, participants were asked if the RCEA model had helped them to reflect effectively on the new concepts. The responses were similar to the previous question indicating that the RCEA framework assisted the students in their reflective processes (refer to Figure 4). The participants were further asked whether they would apply these reflective skills in other units, and the positive responses revealed that students were willing to use this approach in varying degrees to assist with reflecting in other units. This demonstrates the generalisability of the RCEA framework as a tool to aid students in critically reflecting on the content being taught (refer to Figure 5).
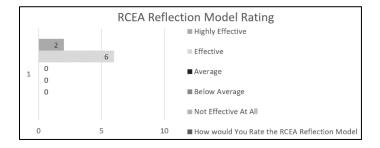
Figure 3

RCEA Reflection Rating
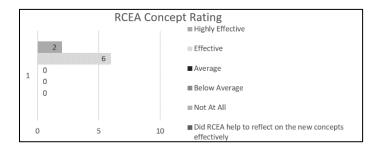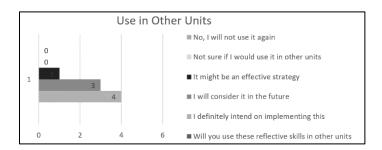

Figure 4

RCEA Concept Rating

Figure 5

Use in other units

Finally, participants were asked to provide suggestions to improve the instructional guide for future students. One participant recommended that an internal cohort stay behind after class for 10 minutes to discuss and ask questions related to the content. Another participant expressed a desire for immediate feedback on their reflections to ensure they were on the right track. Participants also suggested aligning the journal with a unit of study by including it in the study guide or on the learning platform. One participant suggested providing more information at the beginning of the journal to explain the concepts of self-reflection and critical thinking. Additionally, a participant recommended completing the journal online as a weekly consolidation and creating a digital version for electronic submission. Overall, participants viewed the RCEA framework positively and expressed a strong association between their understanding and engagement with the framework and their participation in the trial.

Discussion

Use of the RCEA Framework and CRJ to Develop Critical Reflection Skills

The data indicated that the majority of student participants exhibited limited critical thinking habits and skills prior to their participation in the CRJ pilot program, where they were introduced to, and asked to use, the RCEA framework. When used as a framework for self-reflection, each of the 4 phases of the RCEA framework offers valuable insights into the development of critical thinking skills. During the Review phase, participants exhibited a fundamental grasp of the course material; whilst, in the Connect phase, participants linked their newly acquired knowledge to their past experiences. In the Extend phase, varying levels of critical thinking skills and effort were observed as participants attempted to delve deeper into the subject matter. Finally, in the Apply phase, data evidenced a positive correlation between the participants' engagement with the framework and reflected the participants' developing abilities to apply learning to real-life scenarios. Overall, the study indicates that the participants enhanced their critical thinking capacity, although varying levels of critical thinking language affected how they expressed their reflections, evaluations, and applications of knowledge acquired through the process. This suggests that the RCEA framework was effective in scaffolding students' understanding of general critical thinking principles, although, it must also be noted that the efficacy of the model as a discrete tool is limiting.

The actual RCEA framework that was embedded within the CRJ was intended to be used to support weekly reflections over a 12-week period. A limiting factor was that most student participants did not complete the entire journal or exhibited only partial growth in critical thinking

skills. This could be attributed to the demands of students' busy lives and their reluctance to add another task to their already-full academic load; reduced effort or inability to perceive the value of the activity; or a result of the way in which the CRJ was introduced and expected to be implemented by the student participants. This indicates the significance of further examination as to why the benefit of the CRJ program, for some student participants, had less impact. The literature review indicated the importance of explicit teaching practices for enabling critical thinking skills (Abrami et al. 2008) and data analysis suggests there is value in the RCEA framework in developing critical thinking. However, our findings have provoked further consideration of what explicit teaching practices entail and postulates whether a CRJ that incorporates the RCEA framework may be a component of a multifaceted explicit teaching model for supporting the development of critical thinking.

The data suggests that the explicitness of the RCEA framework was beneficial holistically, and the student participants gained greater understanding through using this framework to reflect on the content; however, some participant feedback indicated that distinct opportunities to engage in discussion and ask questions would have been valuable, along with elaboration during the initial introductions of the CRJ that would clarify the concepts of self-reflection and critical thinking. This feedback signals the importance of the conceptualisation of critical thinking behaviours and the language of critical reflection. Accordingly, while the RCEA framework characterises explicit practice, the explicitness of the intentional teaching that complements or scaffolds a critical reflection framework is perhaps equally imperative. This notion is supported by Lai (2011) who suggests that explicit instruction in critical thinking needs to be included in the curriculum and that teachers should model critical thinking in their instruction and provide concrete examples. It has been concluded that the critical reflection journal would benefit from more explicit instruction during implementation. Therefore, synthesising the results of the research and drawing on literature, the authors propose the use of an explicit think-aloud approach which demonstrates and models what critical thinking looks like in action.

Towards a Multifaceted Explicit Teaching Model for Scaffolding Critical Reflection Skills

The explicit think-aloud approach facilitates opportunities for students to hear examples of the language of critical reflection and explanations of critical thinking behaviours through the educator thinking-aloud and modelling reflective behaviour. Explicit think-aloud occurs when a task or action is performed by the educator, during instruction. The educator demonstrates and models the task or action while concurrently voicing their thinking, what they are feeling and why they are approaching the task in such a way (Demetriou, 2023). What is more, the explicit think-aloud, allows for the educator to include varied, responsive and multiple examples of cognitive processes, which caters for diverse learning needs, experiences and abilities. The explicit think-aloud reflects inclusive pedagogy as it reduces barriers relating to written literacy and reading comprehension, provides flexibility and an alternative means of representation, and presents high expectations (Rose & Gravel, 2011). This teaching strategy brings consciousness to the thinking required to complete the task or action (Rivas et al., 2022) and thus provides learners with an explicit example of the level and application of metacognition required to think critically. This would suggest that using an explicit think-aloud to teach students thinking behaviours for regulating cognition (Schraw & Dennison, 1994) could be considered an explicit teaching practice

instrumental in the development of critical thinking. This would include enacting a tutor-generated, explicit think-aloud, where the educator vocalises examples of their thinking about planning, information management strategies, comprehension monitoring, self-correction strategies and evaluation (Schraw & Dennison, 1994) as a means of engendering the students to build their own consciousness and awareness of their thinking processes (Rivas et al., 2022). The authors therefore conclude that the use of the explicit think-aloud strategy, in conjunction with the RCEA framework, will provide opportunities for the students to witness critical thinking and critical reflection in action.

Vocabulary Skills to Enhance Cognitive Processes

While critical thinking is reliant on the ability to apply effective cognitive strategies and skills appropriate to the context (Willingham, 2008), it is also contingent on vocabulary (Burton et al., 2009). Vocabulary is used to inform critical thinking and reasoning, as well as providing the means for expressing these cognitive processes (Burton et. al., 2009). In further support of implementing the explicit think-aloud, the authors also contend that students require a broader vocabulary repertoire to facilitate the application of terminology to cognitive processes (Demetriou, 2023, p. 29). We contend that students need to be exposed to terminology and phrases fundamental to critical thinking. Therefore, the RCEA framework, combined with an explicit think-aloud teaching strategy and targeted application of vocabulary, terminology and phrasing, presents a worthwhile and viable avenue for further investigation into the development of critical thinking skills.

Importance of Teaching Metalanguage

Burton et. al. (2009) maintain that an established personal lexicon results from individuals engaging in critical thinking tasks, while consecutively preparing them for future opportunities to grasp critical concepts and express them. As the student participants of this pilot study were transitioning into higher education via an enabling program, it is acknowledged that they may exhibit lower levels of academic competence (Priest, 2009) and are therefore likely to present with a limited lexicon of metalanguage for critical thinking. The teaching of verbal reasoning (Burton et al., 2009), including the meaningful instruction of vocabulary, language variety and content terminology (Heron, 2019), therefore, could be considered the explicit instruction (Lai, 2011) of the metalanguage of critical thinking and recognised as another critical component of interventions that successfully scaffold critical thinking. Further to this, the authors recognise the potential for change that is enabled through teaching with a focus on dialogue (Mercer & Dawes, 2014) and consequently establishing a bank or repository of critical thinking metalanguage and the provision of appropriate sentence stems may function as practical applications to support the expansion of student lexicon for engaging with and expressing critical thinking. Further opportunities to investigate how language competency influences the application of critical language and subsequent expression of critical thought are warranted research extensions.
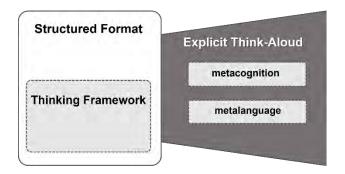
Reconceptualising the Explicit Teaching of Critical Reflection Skills

Further to Lai's (2011) argument that critical thinking can be taught to all individuals through explicit instruction, the authors propose an additional layer to this notion, emphasising the importance of a multifaceted explicit teaching model that extends beyond direct instruction, modelled examples, and conscious and authentic practice. The intent is that the overt use of the CRJ will assist students to refine their ability to think critically and in time they will be able to intuitively apply the RCEA framework as an inherent critical thinking process. This aligns with Willingham's (2008) perspective that providing "hints" can lead to indoctrinating critical thinking skills into students' subconscious, enabling them to apply them instinctively to their studies. Once students have developed this ability to apply critical thinking skills subconsciously, it can be generalised and utilised across a broad range of subjects. Therefore, the use of an explicit teaching model to scaffold the application of the critical reflection skills is likely crucial for internalising critical thinking patterns, while overt and unambiguous structures alone are unlikely to yield satisfactory long-term results for critical thinking.

Lai (2011, p. 43) asserts that teaching of efficacious critical thinking should include constructivist processes, where the explicit teaching of critical thinking behaviours occurs in the context of the curriculum or content, or as a designated unit. While Lai's position is well substantiated across the literature (Abrami et al., 2008; Case, 2005; Facione, 1990; Halpern, 1998; Paul, 1992), the authors' conclusions highlight the importance of qualifying that explicit teaching of critical thinking skills requires a multifaceted approach and, therefore, they propose the Multifaceted Explicit Teaching Model (see Figure 6). This model endorses that critical thinking can be taught by combining a thinking framework, embedded within a structured format, and pedagogical strategy of explicit think–aloud that facilitates exposure to the metacognition and metalanguage associated with critical thinking behaviours.
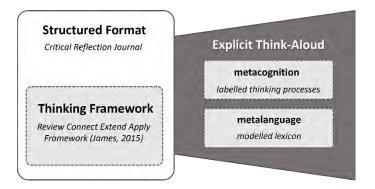
Figure 6

Multifaceted Explicit Teaching Model

Furthermore, the authors contend that using the Multifaceted Explicit Teaching Model supports the development of critical thinking behaviours through the application of the RCEA framework (thinking framework), within the Critical Reflection Journal (structured format), and implementing explicit think-aloud, which facilitates the labelling of thinking processes and modelling of lexicon (see Figure 7).

Figure 7

Multifaceted Explicit Teaching Model as applied to the teaching of critical thinking

An additional salient feature of the explicit think-aloud is that it offers opportunities to provide "recognition of something unsatisfactory in the meaning being constructed" (Bereiter & Bird, 1985, p. 136). Accordingly, the explicit think aloud exposes students to the personal, productive struggle that occurs when thinking critically, and as critical thinking is not characterised by a simple process of the recall of objective concepts (Facione, 2011; Willingham, 2008), it is essential that the educator normalises the non-linear thinking avenues that we venture down when thinking critically. As critical thinking is fundamentally dependent on the individual's approaches to solving problems, making decisions, rationalisation and ideation (Saleh, 2018), and the subsequent rigor it demands in terms of self-awareness and administration of one's own thinking (Kuhn & Dean, 2004), it is logical to acknowledge that critical thinking inherently requires persistence, accountability and vulnerability. Therefore, the explicit teaching of critical thinking should include constructivist processes, explicit pedagogy, and the development of metalanguage in order to empower students to adopt patterns of critical thinking skills.

Limitations

One of the limitations of the pilot study was the difficulty in accessing the reflective journals at the conclusion of the term. Some participants had withdrawn from their studies, while others reported not having completed the journal due to increased workload, or potentially feeling embarrassed to submit an incomplete journal. As the journals were anonymous, the researchers were unable to contact participants to follow up on the return of the booklets, which may have contributed to the limited number of journals. An assumption from the research team is that additional participants may have completed, or at least attempted, the journal with only a fraction actually returning it.

Conclusion

The key findings from this study relate to the development of critical reflection skills amongst the student participants of a pilot program, where engagement, or perhaps lack of engagement with the RCEA was salient. The analysis revealed that the majority of the participants had limited prior experience with critical thinking, and they demonstrated some refinement in critical thinking skills

as they engaged in the trial. It was concluded that the participants' personal written language proficiency and capacity to identify cognitive processes appeared to impact the level of critical thinking applied and conveyed within the CRJ program. The research team proposes that critical thinking skills may be scaffolded more successfully through an explicit teaching model that comprises of the provision of a thinking framework (RCEA) embedded within a structured format (CRJ) and the utilisation of the explicit think-aloud strategy that encompasses the labelling of thinking processes (metacognition) and modelling lexicon (metalanguage) of critical thinking. In conclusion, this paper highlights the importance of explicit instruction in critical thinking with a scaffolded approach for success in developing students' critical reflection skills. This will enable students to cultivate higher order thinking abilities, essential for both success in higher education and their personal and professional futures.

The critical reflection journal, as expounded in this practice paper, is conveniently accessible as a complimentary resource from www.highexpectationframework.com.

Conflict of Interest

The author(s) disclose that they have no actual or perceived conflicts of interest. The authors disclose that they have not received any funding for this manuscript beyond resourcing for academic time at their respective university. The authors have produced this manuscript without artificial intelligence support.

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