THE CRAFTSMANSHIP OF INFUSING CRITICAL THINKING SKILLS:
A MIXED METHODS RESEARCH ON IMPLEMENTATION,
STUDENT OUTCOME, AND FACULTY CONFIDENCE
Laura C. Edwards, Ed.D.

Research Design Overview

Employing a mixed methods explanatory sequential design, this study identified seven teaching strategies employed by faculty members to infuse preselected thinking skills into one course. All professors had previously gone through training on the infusion method. This study assessed the effect of the infusion process on students’ thinking abilities, the professors’ confidence in their ability to teach thinking skills, and the possible correspondence between their confidence level and the development of students’ critical thinking (CT) skills.

Implementation

1. Designate a few hours during the summer to identify and select a few CT skills (2-5) with which you are already familiar and fit well with your class content.
2. Deliberately embed the skills in the syllabus, course calendar, ppt presentations, assignments, and assessments.
3. Prepare a handout with the selected CT skills, provide definitions, and outline the steps required to execute them.
4. Model the skills during class, and repeatedly have students practice using them in small groups, class discussions, reflective writing.
5. Facilitate the transfer of the skills to other contexts.

Strategies

Faculty members selected a few CT skills to infuse in one course content.

Strategies for effective infusion:

Explicit teaching: Faculty highlighted the chosen CT skills, added them to syllabus, created posters, provided handouts with the skills and the steps required to execute them. They make the skills explicit for their students.

Intentionality: They separated a few hours in their summer to deliberately and purposefully infuse the CT skills in each lesson (i.e., lecture, assignments, assessments, and class discussions).

Practicing the skills: Systematic and repeated practice of the CT skills was essential for proficiency in higher order thinking. It implied repeatedly applying the thinking skills in class immediately after teaching them.

Class discussion: Small group or whole class discussions was seen as a key strategy to infuse the CT skills. Professors posited that the discussions rendered opportunities for students to think critically about the class content while practicing the CT skills.

Modeling the skills being utilized. Professors reasoned that, as students observed professors engaging in the process required to implement the skills, that the observation would instigate the students to engage in it more successfully.

Teaching for transfer: The ability to apply the CT skill effectively in another setting. Professors stated that purposefully connecting the CT skills to another setting is indispensable (e.g., other classes, personal lives).

Reflective assignments: Reflective thinking and writing promoted intellectual growth, enhancing students’ CT abilities. They utilized journal logs, reflective questions to afford students opportunity to expand their personal grasp and knowledge of the thinking skills.

Quotes from Faculty

“My experience was that I was already teaching a lot of critical thinking skills without putting the title on them. I was accidentally doing this already. So the fairest way for me to put it is that the biggest change was that I was making them explicit… Let the students know I was teaching critical thinking skills.”

“To infuse CT there needs to be a lot of intentionality. Making sure I implemented them in my presentation, adding them to the assignments, changing the language, so it reflects the chosen skills and the thinking dispositions… streamlining them into a course … the little nuances. It was the same material as before, but the way I described… there was intentionality.”

“The focus was not the content alone but the process. The two meet in the middle. The content is where I house the CT skills.”

“It is very hard for students to transfer knowledge, and that fact is consistent in current research and academic knowledge. Students do not learn how to transfer on their own. So, I ask them, ‘Where is a place in your life where you can use this skill and knowledge besides finances?’

“Something else that I think is helpful is to make out the schedule with the topics and add the CT skills in there.”

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Contact for correspondence: lredwards@taylor.edu
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Results

RQ1. What specific strategies did faculty members employ to infuse CT skills into their class content?
A qualitative, systematic, thematic analysis of the interview transcripts revealed seven salient strategies employed to infuse CT skills into course content. The instructional interventions seemed to be highly effective in enhancing the students’ CT abilities as evidenced by the results of RQ2.

RQ2. Is there a significant difference in the students’ performance of the selected CT skills as measured by pretest and posttest scores? Extant quantitative data was used to address the question. To assess and measure the effectiveness of CT instruction, a recall-based pretest (prior to CT infusion) and posttest (after CT infusion) was administered at the beginning and end of the semester. Results showed growth in 88% of the individual skills to be both statistically ($p < .05$) and practically significant with medium ($d > .5$) to large effect sizes ($d > .8$). The findings in this study indicate that CT skills are not only measurable, but can improve meaningfully through the course of one semester when a combination of effective CT teaching strategies are infused into course content.

RQ3. What is the correspondence between faculty perceptions of their competencies in teaching CT skills and student CT skills performance according to the results of the CT pretest and posttests? Utilizing a Likert scale, professors rated their confidence levels for infusing each of their selected CT skills. Notably the findings and results from this research question revealed that, in general, students’ highest CT skills gains did not occur in the skills in which faculty expressed most confidence. On the contrary, the skills in which six of the seven professors indicated least confidence, not only were students’ improvement statistically significant, but they were among the ones with largest practical significance indicating students decidedly benefited from the implementation of those skills.

Abstract

Despite the widespread recognition that educators and employers view critical thinking (CT) as one of the most desired outcomes of higher education, research findings have indicated that a majority of professors are not teaching it effectively. A review of the literature revealed the need for effective teaching strategies to promote students’ thinking abilities. It also disclosed the need for studies to examine the effectiveness of the teaching strategies on students’ CT skills gains via direct measurements. Finally, the literature review indicated a deficit in the research literature regarding professors’ confidence in teaching the thinking skills and the possible correspondence between their confidence levels and students’ thinking skills development. Employing a mixed methods explanatory sequential design, this study identified seven teaching strategies professors adopted to infuse preselected thinking skills into class content and their effect on students’ thinking abilities. In addition, the study investigated professors’ confidence in their ability to teach thinking skills and the possible correspondence between their confidence level and the development of students’ CT skills. The study was conducted at a liberal arts university in the midwestern United States. The target population for the study was professors who employed the infusion method to foster the thinking skills. Quantitatively, the study utilized extant data from the faculty members’ respective students’ CT pretest and posttests. Dependent $t$ tests were conducted to examine whether students’ scores were statistically and practically significant from the beginning to the end of the semester and to inquire about a correspondence between professors’ levels of confidence and students’ gains. Qualitative data were collected through semistructured interviews with seven faculty members. The strategies for the infusion of the thinking skills emanated from a qualitative, systematic analysis of the interview transcripts: explicit teaching, intentional implementation, consistent practice, class discussions, teaching for transfer, modeling, and fostering reflection. Data obtained through analyzing the pretest and posttest scores revealed advancement in the students’ CT skills with significant effect sizes. The correspondence between professors’ confidence levels in infusing the CT skills and students’ CT improvement was not clear as some students’ greatest gains were in the areas where professors indicated least confidence.