The Efficacy of Metacognitive Reading Strategies in the College Classroom: Student Perception towards the Learning Experience

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Article Info	Abstract
	Many college professors are not adequately trained to help academically underprepared college students understand the course material. Recent statistics indicate that reading proficiency among high school seniors has declined over the past five years. As a result, many students enter college underprepared for college-level reading assignments. These challenges are exacerbated among students at two-year colleges and Historically Black Colleges and Universities (HBCUs), resulting in diminished classroom learning experiences for the students and lower graduation and retention rates for the colleges. This research assesses metacognitive reading strategies implemented within the college classroom, provides a model for focusing attention on college students' lack of comprehension skills, and helps faculty address the problem. Additionally, it provides program methodology, data, analysis, student feedback, and recommendations as a blueprint for improving students' reading and reading comprehension skills and fostering greater student success.

Introduction

Many college instructors do not see teaching students reading skills as part of their job. They often believe that students already have adequate reading skills needed to succeed in college-level courses (Sherfield, Montgomery, & Moody, 2005). According to the most recent National Association of Educational Progress (NAEP) report, basic reading proficiency among twelfth graders was two points lower in 2019 than in 2015. Also, more than 50% of students entering two-year colleges and almost 20% of first-year students entering four-year colleges enroll in remedial courses (Remediation: Higher Education's Bridge to Nowhere, 2012).

Students at Historically Black Colleges and Universities struggle in college because they often have trouble in reading academic content and in understanding what they read, resulting in low rates of student success and retention rates. Our standard approach to reading instruction isn't working for so many black kids—and others. But educators and policymakers are often unaware of this research; some reject it. Schools continue to double down on the same things that haven't worked for decades, expecting a different result. During college, there are more requirements and expectations. Their academic lives become more challenging with higher stakes. For too long, college professors have blamed black students for not working hard enough to master skills and blame their lack of adequate reading skills on poor teacher preparation and apathy (Taylor, 2013).

Part of the University of North Carolina (UNC) System and the second oldest public university in the state of North Carolina (founded in1867), Fayetteville State University (FSU) is an HBCU – Historically Black College or University – located in Southeastern North Carolina. Historically Black Colleges and Universities (HBCUs) are institutions that were established before 1964 with the principal mission of educating Black Americans. For more than 150 years, FSU played a significant role in providing access to postsecondary education for millions of blacks, many of whom currently come from low-income families and are first-generation college students. As pressures mount for all institutions of higher education to be more accountable for demonstrating favorable student outcomes (e.g., retention and graduation rates), HBCUs and other minority-serving institutions face unique challenges that have often been overlooked in evaluations of institutional performance in retaining and graduating students (Richards & Awokoya, 2012).

Reading Across the Curriculum at FSU was founded to target the perceived deficiency in reading comprehension skills among students at Fayetteville State University. The core of the project was the RAC Faculty Course Revision Project, which invited faculty from various disciplines to revise a course, making it more centered upon reading and metacognitive reading activities. Through the RAC Course Revision Project, students' metacognitive reading skills have been identified as critical for success in all disciplines. The comprehensive assessment of the RAC program promoted and evaluated student learning, extended the scholarship of teaching, and enhanced student learning to increase retention and graduation rates and improve academics and co-curricular programs (Kim & Anderson, 2011).

Students' reading comprehension difficulties need to be specifically addressed. When college students read, they oftentimes choose ineffective or inefficient strategies (Wood, Motz, & Willoughby, 1998). Wineburg (2006) noted that the difficulty lies in reading comprehension, which affects students' reading and writing abilities as well as their ability to perform well on college-level research assignments. High school and college students must be taught the skills to locate and analyze complicated information, solve problems they encounter while reading, and connect ideas and concepts (Hammond, 2006).

College students need to be instructed with various reading strategies to enhance their reading ability (Lei et al., 2010; White, 2004). Hadley et al. (2005) suggest an interactive approach to providing assistance for struggling readers. The interactive approach includes condensing context, vocabulary, modeling, summarizing, inference, elaboration, and prediction. This research provides an alternate solution to the prevalent reading problem at FSU by offering a set of metacognitive strategies for improving reading comprehension skills among Black students as well as boosting their motivation towards college success.

Metacognition

Metacognition is defined as "the ability of knowing what one knows and what one does not know" (Gama 2004). Self-reflective activities encourage students to analyze their performance and contrast their actions to those of others and compare their actions to those of novices and experts. The metacognitive reading strategies serve as steps between instructors assigning reading material to students and assessing the students.

Metacognitive awareness enables learners to plan, sequence, and monitor their learning in a way that directly improves performance (Schraw & Dennison 1994).

Cummings et al. (2015) assert that college students' level of critical thinking determines their level of success. Subsequently, applying metacognitive strategies can help ease students' transition and yield educational success Unfortunately, far too few students employ such strategies as part of their course curriculum, particularly as it relates to reading and reading comprehension, components of every college course. For example, when students fail to read or fully comprehend assigned course material, it becomes almost impossible to have a class discussion related to the assigned reading or to further engage in texts. Two weeks later, when instructors assess students' knowledge of the assigned reading material, they find students have performed poorly and thereby have not fully comprehended the material.

Metacognitive strategies serve as a type of pre-assessment before the major assessment to gauge students' progress before the major assessment and to help them better comprehend what they read. In other words, "skilled readers use strategies before, during, and after reading" (Köse1 & Güneş, 2021). Thus, metacognitively-aware learners are more strategic and perform better than unaware learners (Garner & Alexander 1989; Pressley & Ghatala 1990). Furthermore, weaker students benefit even more than stronger students from metacognitive activity (White & Frederiksen, 2000).

Metacognition can provide not only more meaningful learning for college students but more meaningful teaching for college professors. Not all students automatically engage in metacognitive thinking; they must be guided through carefully designed instructional activities. Teachers think about their own thinking regarding instructional goals, teaching strategies, sequence, materials, students' characteristics, students' needs, and issues related to curriculum, instruction, and assessment before during, and after lessons. Thinking about learning is indeed useful; therefore, the teachers and students may be provided awareness about the thinking process (Bransford, Brown, & Cocking 2000 & Lin 2001).

Thiede, Griffen, Wiley, and Anderson (2010) found that students with poor metacomprehension were unable to use corrective strategies to improve their comprehension. Metacomprehension refers to the ability to monitor understanding of information communicated or to recognize a lack of comprehension, and then to apply corrective strategies to clarify comprehension. Interventions are necessary to direct students on ways to enhance comprehension.

Overview of Metacognitive Reading Strategies

Kim and Anderson's previous research (2011) reports implementing reading-centered courses and focusing on developing students' metacognitive reading comprehension skills helps faculty to apply effective reading strategies, implement assessment tools, and integrate reading comprehension into their courses.

Lin (2001) suggests that metacognitive activity should focus on cognitive as well as social aspects of student learning, including strategy training and the creation of a supportive social environment for teaching knowledge about a specific domain and knowledge about the self as a learner. This research project will discuss the value of incorporating metacognitive reading activities into the college classroom, especially in relation to the demand for Twenty-First Century literacy and higher-order thinking skills in today's highly skilled marketplace. Effective metacognitive reading strategies (described below) include dialogical journaling, "quickwrites," pre-reading journals, post-reading journals, double-entry journals, thinking cap questions, and others. The effectiveness of the collaborative Faculty Course Revision Project promotes college professors' awareness and the use of metacognitive strategies in the classroom. This section will outline various metacognitive reading strategies implemented by RAC Faculty Course Revision Project participants, describe the metacognitive strategies for students to be successful in college, and explain strategies that may be used to assist students in developing these essential literacy skills.

1. Pre- reading journal Entry**:** A pre-reading journal is posed to students before an assigned reading and should relate to the topic generally.

2. Post-Reading Journal Entry**:** A post –reading journal prompt is modeled to students after an assigned reading is discussed, analyzed, refuted, etc. It should relate to the topic more specifically that the pre-reading prompt.

3. Multi-Genre Response**:** A Multi-genre response involves students exploring a topic outside of the mode most common to the course. For example, a student might respond to a chapter in a Psychology text in one or a combination of the following ways: write a poem or spoken word; create a series of images (magazine/newspaper clippings, drawings/ sketches, web art, photographs, etc.) write a letter; create a historical timeline; write a monologue or one-act play; write a short, short story; write a personal essay; write a piece of science fiction; create a crossword puzzle)

4. "Quick writes": Quick writes" allow students to respond on paper to a piece of reading (a single quote, a line from a text, term, process, question, etc.) in one to three minutes. Students must respond to questions, such as "What comes to mind after reading the material?" and "What does it really mean"? For example, students might be asked to analyze a quote from a reading selection, explain a scientific process, evaluate a proposed solution, or define a term. The key here is for students to respond to the reading using their own words (a language outside of that used in the text) to demonstrate that they have a clear understanding of what they read.

5. Dialogical Journaling: Dialogical journaling involves students forming the first column, students write four columns on a sheet of paper, in the first column, students write three or four quotes they consider significant from a reading assignment. In the second column, the student responds to the quotes. Next, students pass their daybooks to a peer, and the peer responds to the response in column two. Then, the students pass the daybook to another peer who, in column four, responds to either the response in column two or three. The strategy allows students to view reading from a more complete and critical perspective. One of my English 341 students referred to it as "blogging on a paper." What a great analogy!

6. Double-Entry Journals: Double-entry journals allow students to see information in pairs, which, in turn, helps them to better retain information. Students create two columns on a sheet of paper, making sure

that what is on the left somehow relates to what is on the right, For example, students might write math formulas on the left and actual math problems encompassing the formula on the right.

7. Thinking Cap Questions: Thinking cap questions are an effective way to engage students in critical reading and thinking. White cap questions refer to information available or need within the text. Red cap questions refer to intuition and feelings. Gray cap questions refer to cautions/ problems/ negativities within the text. Yellow cap questions refer to benefits or positives. Green cap questions refer to alternative or creative ideas, and Blue cap questions are metacognitive questions that ask you to summarize the story or relate it to outside concepts or ideas.

8. Thick and Thin Questions: Oftentimes, our teaching involves students learning by coming up with the right answers, but inquiry-based learning yields great results. Sometimes students better comprehend what they read by coming up with questions rather than answers. Using thick and thin questions as a reading comprehension strategy works well. Thick questions are those that address large, universal concepts and often begin with why? How come? I wonder? Also, they might address large content areas, such as what is photosynthesis? Thick questions might be written on the front of a 3X3 sticky note placed within a text or on a sheet of notebook paper. Thin questions, on the other hand, can be answered with a number, a few words, or a simple "Yes" or "No." How many moons does Neptune have is an example of a thin question? Typically, thin questions might be written on a skinny, sticky flag.

These metacognitive reading strategies scaffold the reading assignments, creating a process by which students think about the reading in parts, discuss the reading in parts, write about the reading in parts, and analyze and/or interpret the reading in parts. Such scaffolding creates a process for students to both engage in the assigned reading material and to gauge their comprehension of the assigned reading material before the major assessment (Folk-Ross, 2002). Also, this process enables students to think critically in employing appropriate metacognitive strategies. For example, some strategies involve inferring the meanings of unfamiliar words, recognizing the main idea, and supporting details while others involve connecting ideas in sentences and paragraphs, summarizing a passage or a story, recognizing paragraph patterns, distinguishing facts from opinions, and constructing arguments. All of the strategies require students to reflect on their level of engagement with and comprehension of the text.

Method

Subjects

The subjects of this study were 204 students from Fayetteville State University. There were seven college classrooms including English Composition I (ENGL 110), English Composition II (ENGL 120), Advanced Composition (ENGL 341), Elementary French II (FREN 120), Principles of Sociology (SOCI 210), Contemporary Social Problems (SOCI 220), and Music Appreciation (MUSI 210). The faculty and student participants volunteered to participate. Out of 204, 166 were African American. Although the majority of the student population is composed of African American students, some students are white, Asian, American Indian, and Hispanic.

Table 1 shows ethnic backgrounds and the number of student participants. 162 were female students, and 42 were male students. Their ages were ranged from 19 to 58 and the average age was 25.1.

Table 1. Ethnic Backgrounds and Number of Student Participants

Ethnic Backgrounds	N	Percentage
Black or African American	166	81.4%
White	16	7.8%
Hispanic	10	4.9%
American Indian	5	2.5%
Asian	1	0.5%
Other (Mixed)	6	2.9%
Total number of student participants	204	100%

Out of 204, 56 freshmen, 39 sophomores 22 juniors, 85 seniors, and two graduate students participated in the study. All majors were invited to participate, and 19 different majors participated in the study. Table 2 shows the participants' areas of study.

Table 2. Participants' Areas of Study

Areas of Study	The number of students who participated
Accounting	2
Biology	30
Biotechnology	2
Birth to Kindergarten Teaching	20
Business Management	2
Computer Science	2
Criminal Justice	21
Elementary Education	22
English	6
Forensic Science	4
General Music/ Music Education	3
Mass Communication	2
Math Education	2
Nursing/ Pre-nursing	36
Physical Education	1
Psychology	11
Social Work	6
Sociology	8
Spanish	4
Undecided	24

Most students who participated in the program were STEM majors with Nursing/Pre-nursing majors outnumbering students majoring in Biological Science. Students within the School of Education, including Elementary Education, Birth to Kindergarten, Music Education, and Physical Education majors ranked second in the number of participants. Such data surmises STEM and Education faculty's awareness of students' inefficiency in the areas of reading and reading comprehension and their readiness to adopt alternative and diverse tactics in addressing the challenge. Disciplines such as Accounting, and Business Management had the least number of participants.

Instrument Development

The survey was used as an assessment tool. Each survey item was designed to use a Five-point Likert scale, and five learning categories that contribute to student learning were used to organize the survey. The student survey was given to measure student perceptions of metacognitive strategies in their respective classroom and consists of thirteen questions with open-ended comments, enabling student participants to more accurately self-report on how course learning objectives impacted their learning. Also, the use of open-ended questions allowed for a wide range of response options to capture the quality of metacognitive reading activities students employed in their classes. From the anecdotal evidence, students communicated positive learning experiences such as more active engagement with faculty and an increase in motivation. Some of the behaviors and cognitions students reported on the survey include "The reading strategies introduced in this class were easily transferable to other courses," "I gained academic confidence in the course because of the RAC project and assignments," and "I had the opportunity to engage in informal discussions with my instructor. During the RAC Faculty Course Revision Project workshops, FSU faculty recognized reading comprehension skills as transferable skills that promote an interdisciplinary approach for student academic success.

Data Collection and Analysis

First, we created a faculty questionnaire during the RAC faculty workshop. Faculty participants shared their perception towards students' difficulties in reading/reading comprehension as it relates to their classes and identified essential areas for students to learn content knowledge in their courses. After implementing metacognitive reading strategies, the student survey was developed to measure students' content knowledge, transfer skills, reading comprehension skills, academic confidence, and overall learning skills based on these five categories. This research project demonstrates the effectiveness of using metacognitive reading activities in content areas by measuring these college students' five learning goals. We use a five-point Likert-type rating scale, ranging from "Strongly agree" to "Strongly disagree." Five points also allow a middle rating with two extremes (Strongly and Somewhat) on either side (Unsure). The student survey is designed to measure the effectiveness of using metacognitive strategies in college classrooms. The five categories that the participating faculty identified were used for the student survey to specifically measure the students' learning goals. Five categories are described below:

1. Course Content: Students understood the course content better through the metacognitive strategies implemented in the classroom.

2. Transfer skills/ abilities: Metacognitive strategies introduced in the course were easily transferrable to other courses.

3. Reading Comprehension Skills: Students improved their reading comprehension skills through metacognitive reading strategies implemented in the course.

4. Academic Confidence: Students gained academic confidence in the course because of the metacognitive assignments in the course.

5. Overall Learning Experience/ Engagement: Students overall learning experiences in the course were positive, including student engagement, student interest, and student motivation.

There were 13 items in total and each item corresponds to one of the categories. Table 3 shows each survey item and corresponding categories.

Table 3. Student Survey Categories and Corresponding Items

Learning Categories	Survey Items
Course Content: Students understood the course content better through the metacognitive strategies implanted in the classroom.	1. The three reading assignments helped me understand the course content. 2. I understood the course content better through the reading comprehension activities. 3. I was introduced to a rich diversity of the issues in the course.
Transfer skills/ abilities: Metacognitive strategies introduced in the course were easily transferrable to other courses.	4. The reading strategies introduced in this class were easily transferable to other courses.
Reading Comprehension Skills: Students improved their reading comprehension skills through metacognitive reading strategies implemented in the course.	5. The reading comprehension strategies that were used in this class made me understand the reading selections more easily. 6. I improved my reading comprehension skills because of the RAC project throughout the semester.
Academic Confidence: Students gained academic confidence in the course because of the metacognitive assignments in the course.	7. I gained academic confidence in the course because of the RAC project and assignments.
Overall Learning Experience/ Engagement: Students overall learning experiences in the course were positive, including student engagement, student interest, and student motivation.	8. My overall learning experiences in the course were positive. 9. I found the reading in this course interesting. 10. I felt a sense of community and common ground with other students. 11. I had the opportunity to engage in informal discussions with my instructor. 12. I was inspired to learn more about the course topic through the RAC project. 13. I had out-of-class conversations about the topics/ issues in this course.

Results

Implementing effective metacognitive strategies in the college courses at Fayetteville State University shows an improvement in students' performance in class and an increase in students' positive perception of their learning experience. The survey results in Figure 1 show that students perceive significantly improved reading comprehension skills and academic confidence. The intensity of the study and the systematic instruction of metacognitive strategies led to positive effects for all four categories: Course Content, Transfer Skills/ Abilities, Reading Comprehension Skills, and Overall Learning Experience/ Engagement.
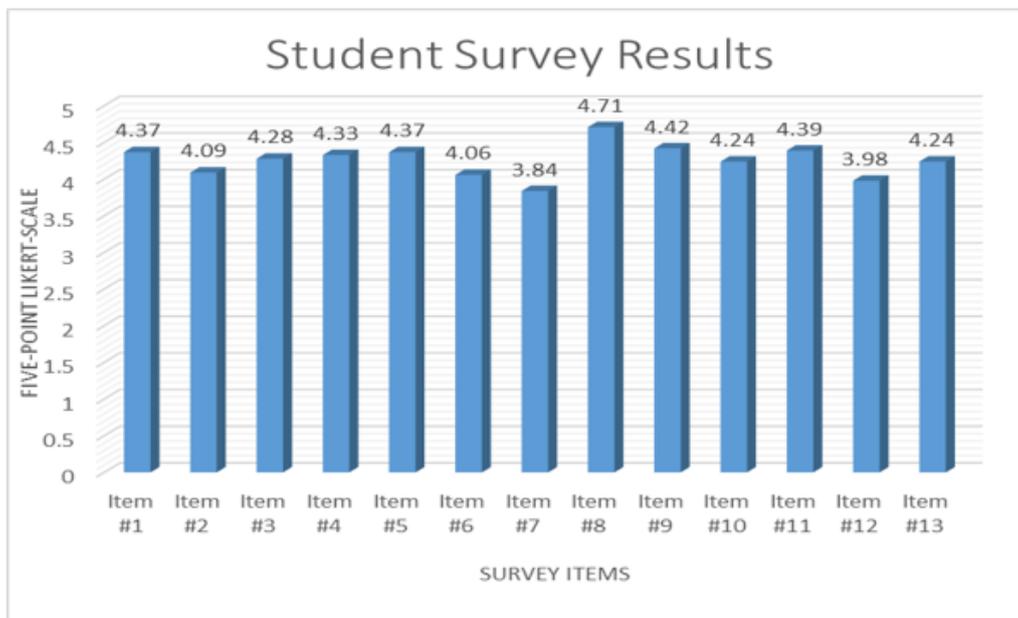

Figure 1. Student Survey Average Scores

Students scored item #8, "My overall learning experience in the course was positive" highest. Item #9, "I found the reading in the course interesting" received the second-highest score. Item #11, "I had the opportunity to engage in informal discussions with my professor" received the third-highest score. Items #1 and #5, "The three reading assignments helped me understand the course content" and "The reading comprehension strategies that were introduced in this class made me understand the reading selections more easily" received the fourth-highest score.   This data shows that students who participated in a RAC Course Revision Project course gained a greater comprehension of course content through assigned readings and gained a greater comprehension of the reading assignments through the metacognitive reading strategies. As a result, students reported a greater interest in the course readings and an overall positive experience in the course.

The open-ended reflection prompt was also given to students. Student survey comments cited the strengths of project participation as being allowed to make better use of class time in relation to reading assignments, more active engagement, an increase in students' ability to think critically in relation to texts, more in-depth discussions of assigned reading materials, use of active reading and an increase in student motivation. The following shares the student comments organized by the five categories.

Course Content

- ✓ Reading across the Curriculum has been one of the most effective programs that I have been a part of. I strongly hope others know about Reading across the Curriculum. It has helped me relate to my classmates, and better understand topics and chapters.
- ✓ I have learned a lot taking this course and doing the reading assignments. The contents in the book were very interesting and I learned many things about different cultures and their traditions. Great Course
- ✓ I found this class to be very interesting and knowledgeable in my understanding of dealing with social strategies. I would recommend this class to other students.
- ✓ I have understood most of the assignments that have been provided and/or given during the course.

Transfer Skills/abilities

- ✓ I liked the assignments that we had to complete for RAC. It made us think about situations and how we think about subjects and matters in depth.
- ✓ All of the information that was presented by the professor really helped me to become a better writer.
- ✓ I was really not a fan of the Reading across the Curriculum because I don't do well on writing papers, but it helped me to look at situations differently.
- ✓ This class helped me learn that you should study hard and use your time wisely.
- ✓ My writing skills have improved.

Reading Comprehension Skills

- ✓ It has helped me understand a bit more about the reading process and catch things that I used to miss.
- ✓ Even though I was just starting out in college, I can seriously say that I developed a lot of skills in this class and really enjoyed it.
- ✓ The class readings were very interesting and kept my attention.
- ✓ The readings were very interesting and brought up many topics for discussion. I enjoyed the class engagement.
- ✓ Reading across the Curriculum was a very positive tool that really helped me through this course.
- ✓ I found it to be supportive and useful.
- ✓ Reading across the Curriculum was very difficult at times, but it challenged me into working harder.
- ✓ I really enjoyed this class, the discussions, and all were very fun!
- ✓ I enjoyed the literature that was introduced in this course.
- ✓ The materials presented in the course were very useful, I am glad I was able to take them.

Academic Confidence

- ✓ The instructor was great in helping me to understand what was required of me to do.
- ✓ The course alone was a learning experience within an experience of college to me. If I could, I would always make this a requirement for all college students.

✓ I liked the class, students, and instructor a lot.

Overall Learning Experience/ Engagement

✓ I enjoy every minute of the course.

✓ This course was very educational and beneficial. I have gained a lot of knowledge!

✓ I have learned how to view things differently

✓ I enjoyed social work 230. The course offered many interesting topics that are helpful with my new adventures. Reading Across the Curriculum is a great tool to use to enhance one's learning experience.

✓ Overall, this class was informative and enriching to my learning experience.

✓ The class was fairly easy, and I liked it because you were a very good instructor.

✓ I learned a lot more than usual through the RAC. It helped me to understand things I couldn't comprehend at first.

✓ The topics could be more interesting. Doing the sheets and being involved was very fun.

✓ I am not a very strong reader, and it sometimes takes me longer to understand the article on which I'm reading. Throughout the experience I have had with RAC; I would say it helped me better understand the text which also helped me answer questions from the text.

✓ I enjoyed the experience a little bit. It made me realize I should think more when answering a question.

✓ The reading was good the only thing was the test it was very difficult, and I feel if we took the course then we should not have to take the test.

✓ The RAC was an interesting experience it is very helpful and should be implemented at the start of the semester.

✓ Need more time to read or multiple choices.

Student responses were overwhelmingly positive in student confidence level as active readers. Students expressed an increase in their confidence level as active readers, as well as their enthusiasm for reading.

Discussion

Many of today's college students struggle with the skills that will help them to experience success within college and society (Bettinger & Long, 2009). To combat these issues, activities may be crafted by college instructors to improve skills that relate to reading comprehension, research, and writing (O'Sullivan & Dallas, 2010; Thiede et al., 2010; Wood et al., 1998). Moreover, faculty do not require specialized knowledge in the area of reading or literacy instruction to implement these strategies, but simply basic knowledge of metacognition and metacognitive strategies along with a willingness to slow the pace of the course and focus on students' level of reading comprehension.

The metacognitive reading strategies helped the faculty to apply effective reading strategies, implement assessment tools, and integrate reading comprehension into their courses. Thus, instructors must scaffold learning by providing clarifying questions and engaging students in activities that emphasize appropriate

learning skills (Gruenbaum, 2012). By utilizing the metacognitive reading strategies, instructors can actively model these skills and strategies by giving specific, concrete examples of good reading behaviors, reading strategies, and providing writing opportunities. For example, students who engage in dialogical journaling in relation to a reading assignment receive an opportunity to not only analyze the text themselves but engage collaboratively with peers in the process.

Conclusion

Every student should be proficient in reading to be successful in college. Teaching reading and acquiring adequate reading skills are an integral part of all areas in college classrooms. Kim and Anderson's previous research (2011) shows that students exposed to direct metacognitive reading instruction (across one semester) generated significant improvements). Students who were deliberately taught metacognitive strategies revealed an increase in their reading comprehension skills and content learning in general. Explicit metacognitive intervention boasts improvements. This study provides further evidence to support metacognitive instruction. Therefore, instructors in all areas need to be skilled in content-based reading strategies. If instructors provide reading opportunities for students, students will be better prepared to understand the text and enable them to complete degrees in a timely manner. Because reading is fundamental to the college curriculum, all college professors must focus on reading comprehension strategies in their courses.

Recommendations

Many college professors are not adequately trained to help academically underprepared college students understand the course material. College courses do not focus on reading comprehension skills. Thus, many academically unprepared students receive much of their instruction from content-area instructors who have not had appropriate professional development to make content instruction comprehensible.

This research assesses metacognitive reading strategies implemented within the college classroom provides a model for focusing attention on college students' lack of comprehension skills and helps faculty address the problem. Students need to think metacognitively about the assigned material they read and implement strategies for comprehending it. On the other hand, faculty need to slow the pace of the course a bit and think metacognitively about how students grasp reading material or if they even grasp it at all by allowing them to focus on not only on WHAT they learn but HOW they learn it. Students need to practice metacognitive strategies in college courses and professors need to leave room for teaching reading comprehension strategies. Both processes are fundamental for success in teaching and learning in the college classroom.

Most importantly, improving college students' reading comprehension will require a collaborative effort from administrators to instructors to use evidence-based practices to meet the literacy needs of struggling college students. The RAC at FSU provided a useful means for teaching students across the disciplines abilities to understand an academic text that are critical for college success.

Acknowledgments

References

Anderson, T. & Kim, J. (2011). Strengthening College Students' Success through the RAC. *Journal of College Reading and Learning, 42*(1), 61-78. https://files.eric.ed.gov/fulltext/EJ961152.pdf

Bettinger, E., & Long, B. T. (2009). Addressing the needs of underprepared students in higher education: Does college remediation work? *Journal of Human Resources, 44*(3), 736–771.

Bransford, J.D., Brown, A., & Cocking, R. (Eds.). (2000). *How people learn: Mind, brain, experience, and school.* Washington, DC: National Academy Press.

Cummings, C. (2015*).* Engaging New College Students in Metacognition for Critical Thinking: A Developmental Education Perspective. *Research & Teaching in Developmental Education, 32*(1), 64-67. https://eric.ed.gov/?id=EJ1084759

Falk-Ross, F. (2002). Toward the new literacy: Changes in college students' reading comprehension strategies following reading/ writing projects. *Journal of Adolescent & Adult Literacy, 45*(4), 278-287.

Gamma, C. (2004). *Integrating Metacognition into Interactive Learning Environment.* Unpublished Ph.D. Dissertation University of Sussex Brighton

Garner, R., & Alexander, P. (1989). Metacognition: Answered and unanswered questions. *Educational Psychologist, 24*, 143-158.

Gruenbaum, E. (2012). Common Literacy Struggles with College Students: using the Reciprocal Teaching Technique. *Journal of College Reading and Learning, 42(2).*

Hadley N. J., Eisenwine, M. J. & Sanders, M. (2005). Teaching reading strategies to adult learners: an interactive approach addressing standardized testing. *Curriculum and Teaching Dialogue, 7*, 65-78.

Hammond, D. (2006). Constructing 21st-Century Teacher Education. *Journal of Teacher Education 57*(3), 300-314. DOI:10.1177/0022487105285962

Kim, J. Y., & Anderson, T. (2011). Reading across the curriculum: A framework for improving the reading abilities and habits of college students. *Journal of College Literacy & Learning*, *37*, 29–40. Retrieved from http://www.j-cll.com/files/37_Kim_Anderson.pdf.

Köse, N., & Günes, F. (2021). Undergraduate Students' Use of Metacognitive Strategies While Reading and the Relationship between Strategy Use and Reading Comprehension Skills. *Journal of Education and Learning*, *10*(2), 99-108. https://files.eric.ed.gov/fulltext/EJ1290614.pdf

Lei, S., Rhinehart, P. et al (2010). *Reading Improvement. Department of Educational Psychology.* The University of Nevada.

Lin X. (2001). Designing Metacognitive Activities. *Educational Technology Research and Development, 49*(2), 23–40. http://homepages.gac.edu/~dmoos/documents/DesigningMetacogAct_000.pdf

NAEP Report Card: *2019 Reading Assessment*. (2019). https://www.nationsreportcard.gov/highlights/reading/2019/

O'Sullivan, M. K., & Dallas, K. B. (2010). A collaborative approach to implementing 21st century skills in a high school senior research class. *Education Libraries, 33*(1), 1-9.

Pressley, M., & Ghatala, E. S. (1990). Self-regulated learning: Monitoring learning from text. *Educational Psychologist, 25*, 19–33.

Remediation: *Higher Education's Bridge to Nowhere* (2012). https://files.eric.ed.gov/fulltext/ED536825.pdf

Richards, D. A. R., & Awokoya, J. T. (2012). *Understanding HBCU retention and completion*. Fairfax, VA: Frederick D. Patterson Research Institute, UNCF. https://files.eric.ed.gov/fulltext/ED562057.pdf

Sherfield, R. M., Montgomery, R. J., & Moody, P.G. (2005). *Cornerstone: building on your best*. Upper Saddle River, NJ: Pearson/Prentice Hall.

Schraw, G., & Dennison, R. S. (1994). Assessing Metacognitive Awareness. *Contemporary Educational Psychology, 19(*4), 460-475. https://eric.ed.gov/?id=EJ498462

Taylor, F. (2013). HBCU Students' Perceptions of Their Readiness for College Composition. *International Journal of Liberal Arts and Social Science, 1*(2). https://ijlass.org/data/frontImages/October2013/11.pdf

Thiede, K. W., Griffin, T. D., Wiley, J., & Anderson, M. C. M. (2010). Poor metacomprehension accuracy as a result of inappropriate cue use. *Discourse Processes, 47(4),* 331-362.

White, B., & Frederiksen, J. (2000). Metacognitive Facilitation: An approach to making scientific inquiry accessible to all. In J. Minstrell and E. van Zee (Eds*.), Inquiring into Inquiry Learning and Teaching in Science*. (pp. 331-370). Washington, DC: American Association for the Advancement of Science, 2000.

White, H. (2004). Nursing instructors must also teach reading and study skills. *Reading Improvement*, *41*, 38-50.

Wineburg, S. (2006). A sobering big idea. *Phi Delta Kappan, 87*(5), 401-402. https://eric.ed.gov/?id=EJ774437

Wood, E., Motz, M., & Willoughby, T. (1998). Examining students' retrospective memories of strategy development. *Journal of Educational Psychology, 90*, 698-704.

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