

Question-Answer-Relationship (QAR) Strategy with Wiki Technology: A Tool to Support Content Area Literacy

Brianna Carney Strahler

Across the nation, students in classrooms continuously struggle with the literacy skills needed to grasp content learning. According to the National Assessment of Educational Progress (NAEP), 70% of eighth-graders and 65% percent of twelfth-graders in the United States do not read at grade level. Approximately six million students struggle with literacy in grades seven through twelve (Alliance for Excellent Education, 2012).

In Pennsylvania, while 82% of eighth-grade students obtained a proficient score on state reading assessments, 62% of eighth-graders scored at a basic or below basic level on national reading assessments for the 2010-2011 school year (Alliance for Excellent Education, 2012).

Unfortunately, many students with poor literacy skills ultimately drop out of school. Of those students who do graduate from high school, approximately one-third are unable to succeed in an introductory level college writing course, and about 40% of employers reveal that they are dissatisfied with high school graduates' ability to read and understand materials (Alliance for Excellent Education, 2012). Therefore, enhancing reading comprehension skills is a crucial part of students' literacy development.

Today's learners are social beings who want to work with their peers in order to unearth new information (Huffaker, 2005). Furthermore, students are regularly immersed in complex technologies, ranging from Wii game systems, Facebook, and blogs to Kindles, smart phones, and iPods. Desktop and laptop computers are no longer seen as a technology for the millennial generation.

This generation multi-tasks and uses multiple forms of technology as their primary form of communication. Students are digital natives who want to explore the world and gain knowledge using high-tech devices.

However, high stakes testing mandated through the federal government as a result of the *No Child Left Behind Act* (NCLB) of 2001 has placed enormous pressure on

teachers to raise reading scores (Kinniburgh & Busby, 2008). With such pressure from government mandates, many educators find it difficult to spend time integrating technology into their classroom. Happily, technology and literacy do not have to be at odds. Teachers can fuse literacy strategies and innovative technologies such as wikis to capitalize on learners' familiarity with technology, promote social interaction in the classroom, and enhance students' literacy development. Educators can use technology as a tool to support students' literacy and learning skills.

The author of this article explains how the Question-Answer-Relationship (QAR) (Raphael, 1982, 1986; Raphael & Au, 2011) can be integrated into a classroom wiki. The QAR strategy is described as a method for enhancing students' abilities to answer comprehension questions (Raphael 1982). Raphael (1982) maintains the QAR strategy teaches learners about the relationship that exists between questions and answers and strategies needed to find information to answer the questions. Additionally, the author synthesizes curricular considerations for teachers to take into account before implementing the QAR strategy with wiki technology.

Using Classroom Wikis to Support Literacy and Learning

A wiki, such as Wikipedia, is a collaborative web document that enables multiple users to create and rearrange content. Marks (2010) defines wikis as a "warehouse of shared knowledge" that permits individuals to post links, graphics, text, and media to wiki pages and rearrange content using simple processing tools (p. 78). When using classroom wikis, such as PBWiki (pbworks.com) and Wikispaces (www.wikispaces.com), educators can establish private access that permits only specific users to view and edit pages, therefore ensuring the safety of learners. In addition, wiki technology allows teachers to track when students visit the site and record what actions they take, thus enhancing accountability among learners (Siegle, 2008). The safety and accountability of wikis permits educators to effectively integrate this innovative technology into the classroom environment.

Wiki technology is advocated as an authentic, multimodal, and collaborative literacy tool. Because content posted on wiki pages is shared with other learners, one positive aspect of wikis is that students can write for a real audience. Audience is a critical aspect of authentic writing, and wikis allow learners to move beyond the teacher as the sole reader of content (Duke, Purcell-Gates,

Hall, & Tower, 2006). For instance, posts made to wikis can be read by a distant reader, such as an e-pal in Puerto Rico, or members of the classroom or school-wide community. There are numerous means of implementing wiki technology into a classroom-learning environment. For example, wiki technology can be used to pre-assess students' knowledge, study guide. Figure 1 illustrates an example of a wiki page where students participate in a KWL pre-assessment activity about exploration.

Additionally, wiki technology permits learners to participate in a community of scholarship in which

students work together to construct knowledge and take ownership of learning (Caverly & Ward, 2008). While learners are often encouraged to read and discuss texts face-to-face with peers in a classroom environment, wikis extend learning beyond the four walls of a classroom. For instance, in Koopman's (2011) study, students reported that they thought about questions posted through online discussion more frequently than when they engaged in face-to-face discussions in the classroom. Integrating wikis into the classroom permits users to engage in a variety of inventive learning activities

Figure 1. JPEG of a Social Studies Classroom Wiki Page. This figure illustrates what a wiki page used in an elementary social studies classroom through the PBWiki site can look like.

The image shows a screenshot of a PBWiki page. At the top, there are navigation tabs for 'Wiki', 'Pages & Files', 'Users', and 'Settings'. Below these is a header with 'VIEW' and 'EDIT' options. The page title is 'Social Studies' with a star icon. It indicates 'last edited by Brianna Carney 6 minutes ago' and has a 'Page history' link. The main content area features a large blue heading: 'What do you know about explorers?'. Below this is a green introductory paragraph: 'Tomorrow in social studies we are going to learn about explorers? Do you know what an explorer is? What does an explorer do? Can you think of any famous explorers? I bet you can!'. This is followed by a blue instruction: 'Before we learn about explorers, let's think about what we already know....'. Three numbered instructions in green text follow: 1. 'In the chart below add what you think you know about explorers or exploration in the left column.', 2. 'Write down a question or two that you might have about explorers or exploration. If you don't already know a lot about this topic then you should have lots of questions!', and 3. 'Leave the column to the right empty. We will come back to this after our lesson on explorers.' To the right of the instructions is a small image of the Earth. At the bottom, there is a table with three columns: 'What do I already know?', 'What do I want to know?', and 'What have I learned?'. The first column contains handwritten text: 'Columbus was a explorer.', 'They travel on ships.', 'They have parrots.', 'They look for stuff if you loose it.', and 'They get paid lots of money.'. The second column contains handwritten questions: 'Are there still explorers today?', 'How much money do they make?', 'What do explorers do?', 'Where do they go?', and 'What happens to their families if they leave?'. The third column is empty.

Integrating the Question-Answer-Relationship Strategy with Wikis

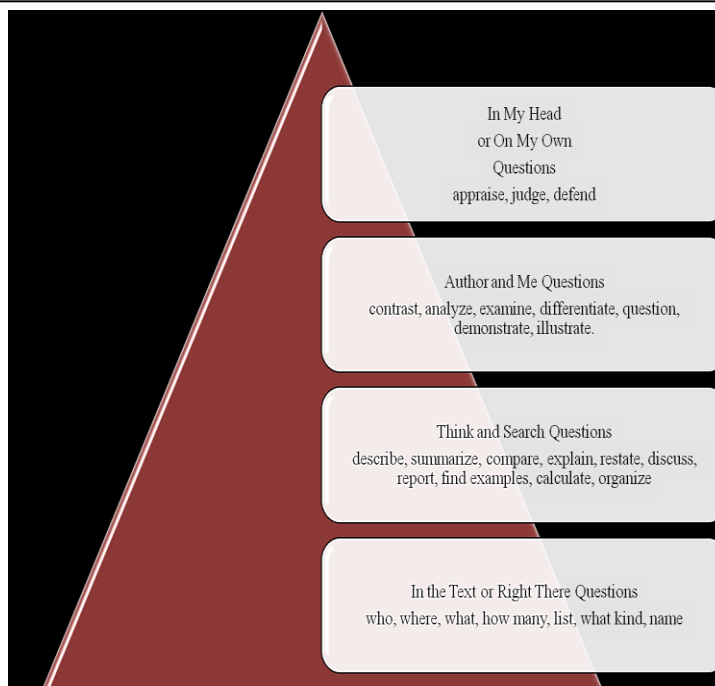
In 2000, the International Reading Association (IRA) stated that cultivating and preserving students' motivation to read is an essential step teachers can take to support students' comprehension of texts. Yet several studies indicate that by the time students enter later elementary grades, their intrinsic motivation to read has decreased significantly (Chapman & Tunmer, 2002; Donahue, Daane, & Yin, 2005; Durik, Vida, & Eccles, 2006; Gottfried, Flemming, & Gottfried, 2001; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). Wiki technology motivates students to participate in literacy processes because they are reading and writing for real audiences, creating innovative and visual multimedia, and socially constructing knowledge, thus enhancing their understanding of content.

Studies indicate that providing opportunities for learners to engage in inquiry and generate questions improves students' reading comprehension, and question generation enables readers to integrate information from the text with their prior knowledge (Billingsley & Wildman, 1988; Davey & McBride, 1986; Gilroy & Moore, 1988; Therrien & Hughes, 2008; Wong, Wong, Perry, & Swawatsky, 1986). Educators often utilize question generation strategies to advance reading

comprehension by teaching students to create and answer questions while reading (Therrien, Gormley, & Kubina, 2006). Question-Answer-Relationship (QAR; Raphael, 1982) is a reading comprehension strategy that helps students understand the different types of relationships that exist among questions and answers, thus strengthening their understanding of texts. Smith (1994) contends that "...the absence of comprehension is related to not knowing the relevant questions to ask, or not knowing how to find the relevant answers" (p. 53). In addition, the QAR strategy helps learners integrate information within a reading, relate textual information to their own prior knowledge, and monitor their understanding while reading (Therrien & Hughes, 2008). Essentially, by understanding the different types of relationships between questions and answers, students will have a better understanding of how to both generate and respond to questions.

The QAR strategy enables teachers to guide learners to higher levels of cognitive and literacy development (Raphael & Au, 2001). Raphael and Au (2001) identify the various relationships among questions and answers as "Right There," "Think and Search," "Author and Me," and "On My Own." Figure 2 portrays the types of relationships present between questions and answers and provides examples of the types of words that

Figure 2. Pyramid of QAR strategy. This figure depicts the hierarchy of specific relationships between types of questions and answers and provides examples for the types of thinking students can be required to do with each level of question (Raphael, 1982).



are associated with each type of relationship. “Right There” relationships are questions in which the answers can be extracted almost directly from the text and focus primarily on recall of information. “Think and Search” relationships are also based on recall; however, answers to questions are typically found in more than one place. These types of questions can involve the manipulation, comparison, or application of information from the text. “Author and Me” questions require learners to use prior knowledge as well as information from the text and facilitate analysis and synthesis of information. Raphael and Au (2011) maintain, “Author and Me QARs create a bridge between the cognitive strategies that students use to construct the author’s intended meaning and personal responses created to make text-to-self and self-to-text connections” (p. 129). Finally, “On My Own” relationships require students to utilize the highest level of thought processes. Through these types of questions, learners evaluate information based on their prior knowledge. “On My Own” questions can also be utilized before reading to access, activate, or build learners’ prior knowledge (Raphael & Au, 2011). However, teachers often put too much focus on ensuring students are able to correctly categorize each question. The significance of the QAR strategy is that it allows learners to draw on appropriate resources to answer a question and teaches them to support their answers with evidence that is appropriate (T.E. Raphael, personal communication, April 9, 2012) posits, “Kids may argue about which QAR it is, but in the end, that’s just great as they are arguing about what source provides appropriate or ‘best’ evidence.” The QAR strategy promotes literacy development through questioning and engages learners in the active participation of learning.

Using wiki technology, educators can easily implement the QAR strategy using both narrative and expository texts throughout content area classrooms and across grade levels. For example, in a social studies lesson, readers can complete an expository reading about the types of food Pilgrims ate during the first Thanksgiving in *America’s REAL First Thanksgiving* by Robyn Gioia. Using the wiki page, the educator can post questions and have students answer as well as label the types of questions, thus ensuring that students are reflecting on their thinking process. For instance, the teacher could ask, “What types of food did you think the Pilgrims ate before you read this? Were you right about anything?” However, it is important to remember that teachers should not place too much emphasis on a student’s ability to categorize questions. Raphael (personal communication, April 9, 2012) maintains,

“Categorizing is useful only if the point of the lesson is to test students’ knowledge of the vocabulary.” The QAR strategy provides educators and learners with language to clarify why one answer may be more appropriate than another (T. E. Raphael, personal communication, April 9, 2012). Readers can even post their own questions for their peers to answer. As the teacher and learners exchange and share questions and dialogue, they are creating a community of learning. Figure 3 depicts an example of how the QAR strategy can be further blended with wiki technology in a social studies classroom. In this example, the teacher provides a question for students to practice answering individually. Learners then have the opportunity to collaboratively create questions and post answers to their peers’ questions. Students also are asked to identify the relationship between questions and answers. As students become advanced in using the QAR strategy, the questions can require more higher-order thought processes and critical thinking skills.

After reading a short story in an English class, students can continue discussion in the wiki classroom using the QAR strategy. Learners can be assigned to different wiki pages and construct questions together and evaluate the relationship between each question and answer. For example, one group can construct questions about the characters’ motivations, and another group craft questions about how the setting contributes to the plot development. For each question, students can identify the QAR question type, thus reflecting on their own thinking. Thus, implementing the QAR strategy with wiki technology enables teachers to differentiate their lessons for all learners. Moreover, as students generate questions and contemplate their understanding of the reading, they enhance their metacognitive skills and cultivate critical thought processes. For instance, when reading *Flowers for Algernon* by Daniel Keyes, “Why might an intelligence-altering operation be unethical or risky?” is an appropriate question. While students may not feel comfortable to discuss this question during class time, wikis provide an appropriate context for extending learning outside of the classroom. Promoting digital discussion also increases reading comprehension because students are required to negotiate and justify their interpretation of the text (Yuill, Pearce, Kerawalla, Harris, & Lucking, 2009). Through the use of wiki technology, learners engage in interactive discussions that support higher thought processes and enrich understanding of texts.

Additionally, a math teacher can post authentic word problems for students to consider. Authentic word problems ask learners to consider something relevant to their personal lives or in the world. For example,

“Rainforests cover only a small part of the Earth but they are home to more than half the world's plants and animals. It is estimated that rainforests are being cut down at the rate of 100 trees per minute.” Using this prompt, students can create questions that ask peers to manipulate information, such as “How many trees are cut down per year?” Learners could research types of animals in a rainforest and the percentage of the Earth that is covered in rainforests and craft new word problems for peers to solve. However, students can also generate questions that probe deeper reflection and inquiry, such as “What effect will cutting down trees at such a rapid rate have on the

world's sustainability?” As students construct and answer questions, they utilize critical thinking skills and reflect on the content they learned. Additionally, learners are making connections between their prior knowledge and understanding of new content. Integrating the QAR strategy into a wiki classroom allows students to extend their interactions with content using digital spaces and permits learners to establish connections, consequently cultivating deeper understandings (Kissel, Hathaway, and Wood, 2010). There are numerous ways the QAR strategy can be integrated with digital learning to improve comprehension and support literacy development.

Figure 3. JPEG of a QAR Strategy Wiki Page. This figure illustrates how the QAR strategy can be fused with a social studies classroom wiki page through the PBWiki site.

The Pilgrims' Real Thanksgiving Menu

Mmmm...pumpkin pie, turkey, sweet potatoes! Delicious Thanksgiving food! But did Pilgrims really eat those foods at the first Thanksgiving?

Directions: After reading about the types of food Pilgrims ate at the first Thanksgiving, create 3 QAR questions that other students in the class might answer. You must also answer one QAR question and label what type of relationship is present.

Try a practice QAR question in your head!

Q: How did the Pilgrims cook their meat?

[Click here for the answer!](#)

What type of relationship exists between the question and answer?

[Click here for the answer!](#)

Now it's time to try some on your own! Don't forget you need to create 3 questions and answer 1 question. Be sure to label and answer the question. Have fun!

What is dried Indian corn?

Its maze. This is a right there question.

What is venison?

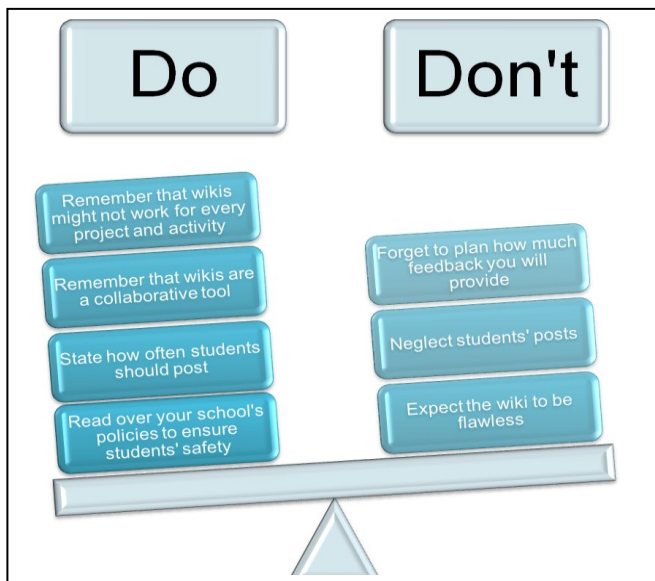
What types of food did you think the Pilgrims ate before you read this? Were you right about anything?

I thought they ate all the foods we do like corn and pupkin pie and stuff. And turkey and the purple jelly stuff. I think this is a author and me question.

Curricular Considerations for Utilizing Classroom Wikis

Before integrating literacy strategies into a classroom wiki, teachers should acknowledge specific curricular considerations. Educators can hold students accountable for the learning contributions made on the wiki by tracking the changes made to the page, providing frequent feedback, using a rubric when necessary, and offering multiple models and scaffolds to support students' success. First, educators should review proper posting etiquette with students. For instance, students should understand the importance of respecting others online and not using inappropriate language. Although teachers have the capability to remove content posted on students' pages and track each post made by specific learners, students should understand they are responsible for what they post. Figure 4 identifies do's and don'ts for educators to take into consideration when implementing wiki technology in their classrooms.

Figure 4. Do's and Don'ts of Classroom Wikis. This figure demonstrates considerations educators can take into account when integrating wikis into the classroom learning environment

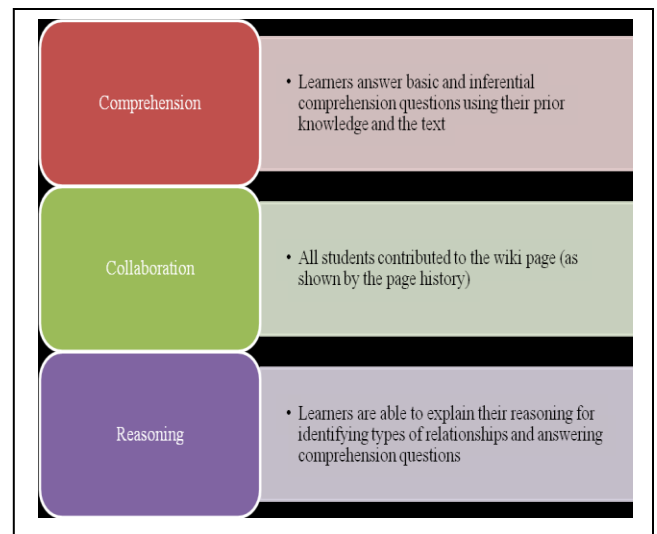


Second, educators need to decide how learners' use of the QAR strategy on the wiki will be assessed and clearly outline the requirements of the work to be done by students. Generally, formative feedback would be appropriate for this type of instructional activity, and teachers can provide such feedback by posting comments directly on students' wiki pages. For instance, teachers

can respond to a learner's QAR question posted on the wiki or even help guide students in generating questions. Assessment of tech-based learning can be difficult; however, creating a rubric to assess students' use of the QAR strategy can be helpful. Figure 5 lists criteria educators can use to assess students' use of the QAR strategy on the wiki page as discussed in this article.

The criteria identified in Figure 5 reflect with wiki technology. For example, students should be able to engage in dialogue about the relationships between questions and answers posted on wikis. Although that category of the relationship between the question and the answer will change dependent of students' prior knowledge, students should be able to discuss strategies as to how they can find the answer to the question (Raphael, 1986; Raphael & Au, 2011). Additionally, because wikis are a collaborative learning tool, each learner should contribute to the creation of content on the wiki page. While this criteria serves as groundwork for evaluation, educators can expand upon the criteria to meet specific content or lesson objectives and standards.

Figure 5. QAR Assessment Criteria. This figure illustrates how educators can assess learners' use of the QAR strategy through wiki technology



Finally, appropriate modeling and scaffolding is a significant factor in the success of integrating the QAR strategy into a classroom wiki. Scaffolding involves support, guidance, and instruction provided by a teacher to help learners master a new skill, solve a problem, or complete an activity (Fuhler, Farris, & Nelson, 2006). For example, educators can begin by creating QAR

questions for students to answer and then move on to having learners identify the relationship between the questions and answers. Teachers can guide students to a point where they are able to craft their own questions using the QAR strategy. Additionally, educators can scaffold the QAR strategy by the difficulty of questions. For instance, students can begin answering “Right There” questions that depend mostly on learners’ ability to recall information for the text. Using appropriate modeling techniques, teachers can help students work with “On My Own” questions that require learners to use higher-order thought processes. When educators label and model relationships between questions and answers, they should provide strong examples. Teachers can also utilize guided practice techniques that emphasize critical thinking (Knipper & Duggan, 2006). When integrating the QAR strategy into wiki technology, educators should take into account students’ needs and skills, the instructional goals of the lesson, and the atmosphere of the learning environment.

Conclusion

High stakes testing mandated by the federal government has placed tremendous pressure on educators to raise student achievement scores (Kinniburgh & Busby, 2008). Nevertheless, many students in our classrooms still struggle with the literacy skills needed to read and understand material. While educators understand that technology is a substantial part of students’ lives, many teachers find it difficult to integrate technology into the learning environment when they have to focus on improving learners’ literacy achievement. Teachers are finding that technology can be used as a tool to support students’ literacy skills. Merging technology and literacy strategies strengthens learners’ reading comprehension while enhancing their critical thinking skills, establishing positive relationships among students, and supporting content learning. Consequently, creating learning environments that facilitate the development of literacy skills through technology is crucial to cultivating students’ literacy development.

About the Author

Brianna Carney Strahler is currently a secondary social studies teacher in a public school district and is pursuing her doctoral degree in Curriculum and Instruction at Indiana University of Pennsylvania. She is also seeking a reading specialist certification. Her research interests include content area literacy, integrating technology and literacy strategies, reading motivation, and summer reading. She can be reached at briannacarney@yahoo.com.

References

- Alliance for Excellent Education. (2012). *Adolescent Literacy Fact Sheet*. Retrieved May 14, 2011, from http://www.all4ed.org/publication_material/fact_sheets
- Billingsley, B. S., & Wildman, T. M. (1988). The effects of rereading activities on the comprehension monitoring of learning disabled adolescents. *Learning Disabilities Research, 4*(1), 36-44.
- Caverly, D. C., & Ward, A. (2008). Techtalk: Wikis and collaborative knowledge instruction. *Journal of Developmental Education, 32*(2), 36-37.
- Chapman, J. W., & Tunmer, W. F. (2002). Reading difficulties, reading-related self-perceptions, and strategies for overcoming negative self-beliefs. *Reading and Writing Quarterly, 19*(1), 5-24.
- Davey, B., & McBride, S. (1986). Generating self-questions after reading: A comprehension assist for elementary students. *Journal of Educational Research, 80*(1), 43-46.
- Donahue, P. L., Daane, M. C., & Yin, Y. (2005). *The nation’s report card: Reading 2003* (Publication No. NCES 2004-453). Washington, DC: U.S. Government Printing Office.
- Duke, N. K., Purcell-Gates, V., Hall, L. A., & Tower, C. (2006). Authentic literacy activities for developing comprehension and writing. *The Reading Teacher, 60*(4), 344-355.
- Durik, A. M., Vida, M., & Eccles, J. S. (2006). Task values and ability beliefs as predictors of high school literacy choices: A developmental analysis. *Journal of Educational Psychology, 98*(2), 382-393.
- Fuhler, C., Farris, P., & Nelson, P. (2006). Reaching across the curriculum: Opening the doorway to the past through artifacts. *The Reading Teacher, 59*(1), 646-659.
- Gilroy, A., & Moore, D. (1988). Reciprocal teaching of comprehension – fostering and comprehension monitoring activities with ten primary school girls. *Educational Psychology, 8*(1), 41-49.
- Gioia, R. (2007). *America’s real first Thanksgiving*. Sarasota, FL: Pineapple Press.
- Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: A longitudinal study. *Journal of Educational Psychology, 93*(1), 3-13
- Huffaker, D. (2005). The educated blogger: Using weblogs to promote literacy in the classroom. *ACE Journal, 13*(2), 91-98.
- International Reading Association. (2000). Excellent reading teachers: A position statement of the International Reading Association. *Journal of Adolescent & Adult Literacy, 44*(2), 193-200.
- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children’s self-competence and values: Gender and domain differences across grades one through twelve. *Child Development, 73*(2), 509-527.
- Keyes, D. (1966). *Flowers for Algernon*. Orlando, FL: Harcourt Brace.
- Kinniburgh, L. H., & Busby, R. S. (2008). No social studies left behind: Integrating social studies during the

elementary literacy block. *Journal of Content Area Reading*, 7(1), 55-85.

- Kissel, B., Hathaway, J. I., & Wood, K. D. (2010). Digital collaborative literacy: Using wikis to promote social learning and literacy development. *Middle School Journal*, 41(5), 5-64.
- Knipper, K. J., & Duggan, T. J. (2006). Writing to learn across the curriculum: Tools for comprehension in content area classes. *The Reading Teacher*, 59(5), 462-470.
- Koopman, B. L. (2011). From Socrates to wikis: Using online forums to deepen discussion. *Kappan*, 92(4), 24-27.
- Marks, D. B. (2010). Working with wikis: Collaboration in the 21st century. *Journal of Technology Integration in the Classroom*, 2(2), 75-89.
- Raphael, T. E. (1982). Question-answering strategies for children. *The Reading Teacher*, 36(2), 186-190.
- Raphael, T. E. (1986). Teaching question answer relationships, revisited. *The Reading Teacher*, 39(6), 516-522.
- Raphael, T. E., & Au, K. H. (2001). *Super QAR for test wise students: Teacher resource guide, Guide 6*. Chicago, IL: Mc-Graw-Hill/Wright.
- Raphael, T. E., & Au, K. H. (2011). Accessible comprehension instruction through Question Answer Relationships. In J. R. Paratore & L. McCormack (Eds.), *After early intervention, then what? Teaching struggling readers in grade 2 and beyond* (2nd ed.) (pp. 115-136). Newark, DE: International Reading Association.
- Siegle, D. (2008). Working with wikis. *Gifted Child Today*, 31(1), 14-17.
- Smith, F. (1994). *Understanding reading* (5th ed.). Hillsdale, NJ: Erlbaum.
- Therrien, W. J., & Hughes, C. (2008). Comparison of repeated reading and question generation on students' reading fluency and comprehension. *Learning Disabilities: A Contemporary Journal*, 6(1), 1-16.
- Therrien, W., Gormley, S., & Kubina, R. (2006). Boosting fluency and comprehension to improve reading achievement. *Teaching Exceptional Children*, 38(3), 22-26.
- Yuill, N., Pearce, D., Kerawalla, L., Harris, A., & Lucking, R. (2009). How technology for comprehension training can support conversation towards the joint construction of meaning. *Journal of Research and Reading*, 32(1), 109-125.
- Wong, B. Y. L., Wong, W., Perry, N., & Sawatsky, D. (1986). The efficacy of a self-questioning summarization strategy for use by underachievers and learning-disabled adolescents. *Learning Disabilities Focus*, 2(1), 20-35.