

# Wikis: Promoting Collaborative Literacy through Affordable Technology in Content-Area Classrooms

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Educators may realize the impact technology has on students, but may be ill equipped to integrate high-tech devices into the classroom in an affordable way. Educators can capitalize on students' experience with technology by incorporating wikis, a collaborative webpage, into classroom instruction. Studies indicate that wiki technology can greatly enhance student collaboration and build content-area literacy skills. There are several research-based applications for implementing wiki technology into content-area classrooms. However, educators must consider the effect of wikis on curricula before integrating wikis into the classroom.

*Keywords:* Literacy, Technology, Collaboration, Wiki

## Introduction

The use of technology is this generation's defining characteristic. Students are submersed in multifaceted technologies on a daily basis, ranging from the Internet, Instant Messenger, and Facebook to i-pads, i-pods, and i-phones. As educators, we must take into account that our students are digital natives and social beings that want to discover new information through high-tech devices (Huffaker, 2005). We must further consider how we can take advantage of technology in order to better serve our students (Hazari, North, & Moreland, 2009). There are many innovative technologies, such as electronic white boards (SMART boards), document cameras, and classroom response systems (clickers), which educators can integrate into curricula that capitalize on students' familiarity with technology and promote collaboration and literacy in the classroom.

Content area teachers—educators who teach math, science, English, and social studies—understand that their subjects require a specific kind of literacy skill in order for students to understand the main concepts of that subject. Content area knowledge requires more than just mastering information (Knipper & Duggan, 2006). Integrating wiki technology into content area classrooms enables students to engage in critical thinking, productive learning, and retention of content area material (Smith, Rook, & Smith, 2007) while building social relationships with their peers. Collaborative classroom literacy can be defined as activities that permit students to work with their peers while engaging in higher order thinking, critical reading, and reflective writing (Boling, Castek, Zawilinski, Barton, & Nierlich, 2008; Jewitt, 2005; Marks, 2010; Leu, 2000; Smith, Rooks, & Smith, 2007). Teachers cannot ignore the significance of using technology in content area classrooms (Leu, 2000), but what if a school does not have the latest gadgets? What if funds are not available for content area educators to integrate such technology in the classroom?

This article reviews how educators can integrate wikis into their classroom as an affordable technology. It outlines the

structure of wikis, examines ways wikis promote a safe collaborative classroom atmosphere, and considers ways wikis support content area literacy. Furthermore, this article synthesizes curricular considerations for educators to take into account before integrating wikis into their classroom.

## What Is a Wiki?

A wiki is an innovative social technology tool that supports interaction and collaboration among users and offers new possibilities for learning (Paus-Hasebrink, Wijnen, & Jadin, 2010). According to Judd, Kennedy, and Cropper (2010), "Wikis are websites that can be interactively edited by any number of people using simple online tools" (p. 341). Basic collaborative wiki tools include file sharing and content editing (Olliges, 2010). Although a relatively new technology, wikis are gradually being integrated into classroom environments, and educators are realizing the value of wikis as project-based learning tools that facilitate participation among students (Paus-Hasebrink, Wijn, & Jadin, 2010). Studies (Barron, Schwartz, Bye, Moore, Petrosino, Zeck, & Bransford, 1998; Helle, Tynjala, Olkinuro, & Lonka, 2007) indicate that project-based learning enhances student motivation. Therefore, wikis serve as a means to engage students and enhance their motivation to become active participants in learning.

Furthermore, the use of wikis in the learning environment is centered on the theory of collaborative learning. DeWitt and Siraj (2010) maintain, "Collaborative learning refers to learning through activities and discussion which require learners to work towards a common goal" (p. 171). Wiki technology enables learners to cooperate to attain learning goals as they construct their own knowledge. Thus, employing wiki technology in the learning environment is dependent on the culture and community of the students and is not centered on the teacher (DeWitt & Siraj, 2010). Additionally, research (Matthew & Felvegi, 2009) signifies that learning experiences through wiki technology promote in-depth processing of content and enhances

learning outcomes for students. Educators who wish to engage learners in creative community-based learning can utilize wikis to enhance students' social interaction (Twu, 2010). Wikis facilitate cooperation and enhances students' social interaction while creating an authentic learning community.

Marks (2010) describes wikis as a "warehouse of shared knowledge" in which learners can deposit work while increasing their knowledge base (p. 78). Wikis can be public sites where any person can edit and comment or private sites controlled exclusively by a group or individual. The most widely known example of a public wiki is Wikipedia. On the Wikipedia site, multiple users can edit and create content. Similar to Wikipedia, classroom wikis allow more than one student to create and publish content. Students start with a blank workspace and can add and edit images, text, animations, links, and files. Multiple students have the ability to collaborate on a single document (Koopman, 2010). In addition, educators can choose to set the security level of wikis. Wikis can be set at public, protected, or private; however, many educators choose to set the security to private so that only certain individuals may view and edit the page, thus ensuring student privacy (Siegle, 2008). PBWiki (pbwiki.com) offers a free wiki site that educators can use in the classroom and only requires an email address and login information. Through PBWiki, teachers control who can read and edit the wikis. Wikispaces is another wiki site that is free to educators. Similar to PBWiki, educators can set up private accounts through Wikispaces with an email address and login information. Both sites ensure student accountability because teachers can track students' posts and changes they make to their wiki pages through their account information. Using sites such as PBWiki and Wikispaces, educators can safely integrate multi-user technology into the classroom, enabling students to work with their peers and think critically about classroom content.

### **How Do Wikis Promote a Safe Collaborative Classroom Atmosphere?**

After introducing a classroom project and allowing my students to form groups, I noticed a predominantly social student sitting apathetically at his desk and staring at his assignment. When I asked why he was secluding himself from the rest of the students, he confided that he was upset that no one had picked him to be a part of their group. As educators, we encountered students who feel isolated from other students in the class. Many teachers attempt to overcome the issue of student isolation by forming groups for students. However, educators are then faced with the issue of groups of students who do not get along or refuse to work together. The same isolation and group formation issues are present when implementing activities involving technology in the classroom; however, wiki technology provides opportunities to build a safe collaborative classroom atmosphere. A project that involved the use of wikis would have enabled the student to work collaboratively with the rest of the class without the threat of isolation.

Wikis are a powerful 21<sup>st</sup> century tool that redefines what it means for students to collaborate with their peers and are being widely promoted as safe collaborative tools (Judd, Kennedy, & Cropper, 2010). Students need to experience security and acceptance, and wiki technology provides a safe learning envi-

ronment in which learners examine their previously held beliefs. Furthermore, wikis teach students to criticize ideas, not people, because learners are provided with a forum to discuss their thoughts. Koopman (2010) maintains, "Wikis provide a non-judgmental method of discourse that makes it safe to walk away, reflect, consider how a comment is being viewed by others, and then focus one's thinking or ask for clarification" (p. 25). Wikis allow students to work together without the danger of students being isolated from groups or students being forced into groups. Additionally, collaborative classroom wiki projects foster the social skills of cooperation, respect, and sharing through group study. Wikis provide a digitally safe space for students to generate new ideas and reflect on their beliefs without threatening face-to-face interaction with their peers.

Wiki technology allows students to simultaneously develop social and cognitive skills. Ruth and Houghton (2009) contend, "Wikis facilitate the construction of knowledge at the screen-face such that interacting with learning processes occurs in a place as a construction rather than a body of knowledge being absorbed" (p. 135). Through wiki technology students engage in higher-order thinking, discussion, and analysis by working together with their peers. Wiki technology promotes practical learning experiences that emerge from the social construction of knowledge. Group collaboration enables learners to craft understanding, and learners are able to grapple with their previously held beliefs and ideas (Cheng, Lam, & Chan, 2008). For instance, research (Marks, 2010) signifies that students feel wikis advance collaborative work and learning. Additionally, by integrating wikis into the classroom, content area teachers create a shared writing and learning space for students (Kissel, Hathaway, & Wood, 2010). Wikis enable students to safely collaborate with learners and create positive peer while engaging in stimulating critical thinking.

There are several collaborative applications for integrating wikis into content-area classrooms (Kissel, Hathaway, & Wood, 2010). Learners can use wikis to construct knowledge with other students and reflect on content they have learned in class. For example, in a social studies class students could participate in a collaborative storytelling wiki in which students make contributions and design a historical fiction story together. Content area teachers may present discussion of supplemental text through wiki technology. For instance, when reading an article about the unexplored ocean floor in science class, students can engage in discussion of ideas through a wiki page. Figure 1 illustrates an example of a wiki page where students formulated discussion about the unexplored ocean floor. Students were asked to share their response to the question, "Do you think exploring the ocean floor through robotic technology is worth its cost?" Students were also encouraged to ask questions about the topic and share any further information they gathered.

Similarly, when reflecting on how to solve real-world problems in a math course, students can discuss possible explanations to the problems and compare their ways of solving the problems. Wiki technology can also be used to discuss literature used within a content area classroom. Kissel, Hathaway, and Wood (2010) contend, "The wiki enhances literature circle groups and helps students see the connections among various texts and the lessons to be learned from them" (p. 59). Furthermore, students have opportunities to share their personal

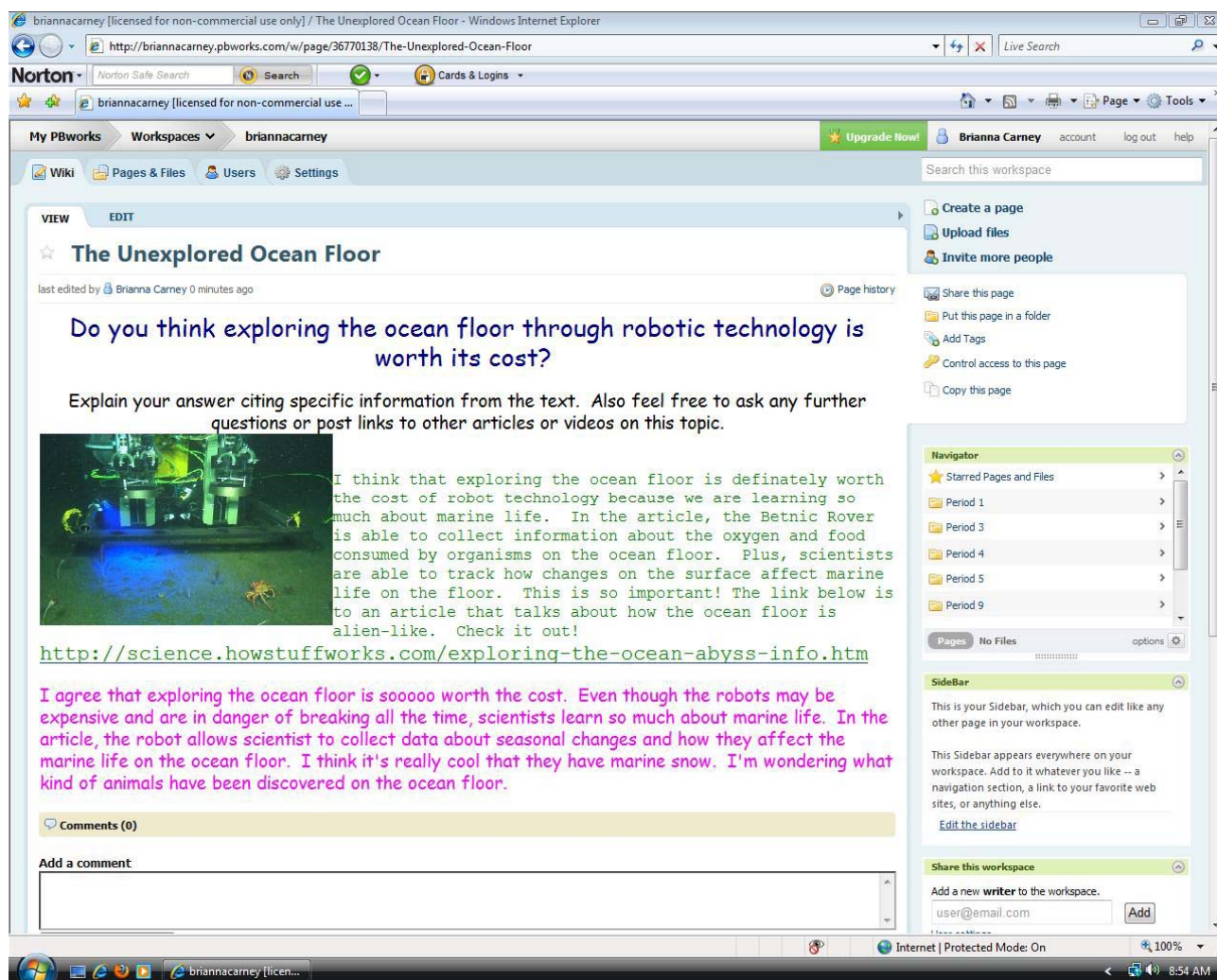


Figure 1.  
 JPEG of a Science Classroom Wiki Page. This figure illustrates what a wiki page used in a science classroom through the PBWiki site might look like.

work by uploading poetry, stories, and class projects through a student portfolio wiki.

### How Do Wikis Promote Content Area Literacy?

After completing a wiki project on the Bill of Rights, one student told me, "It was cool to see what I know about our rights up on the web site. I didn't realize the Bill of Rights was so important until we had to think about them and create our web page." In this project, my students were asked to create wiki pages about each of the ten amendments included in the Bill of Rights. Figure 2 illustrates how my students had to explain the amendments in their own words and develop examples as to why the amendment is still relevant today.

Students enjoyed this activity because they were responsible for creating a meaningful and informative web page about the Bill of Rights. Furthermore, my students were able to explain the content material in their own words and reflect on their understandings of content (Knipper & Duggan, 2006). The students did not even realize how critically engaged they were

with social studies content.

Content teachers understand that in order for students to be successful they must develop literacy skills that can be applied to content area learning. Learners need opportunities to develop cognitive processes by critically evaluating content area material, rather than rote memorization (Knipper & Duggan, 2006). Wiki technology enables students to demonstrate their learning through a digital space. Learners can use wikis to identify relationships between concepts and make connections to prior knowledge. As students create their wiki pages, they develop their ideas while connecting and integrating new concepts (Johnson & Holcombe, 1993). Wikis help students become better problem solvers and help students understand how to analyze and synthesize information. Furthermore, wiki activities allow students to critically evaluate the world around them because learners are able to expand learning to make meaning of content (Knipper & Duggan, 2006; Peterson, 2007). They can ask each other questions to probe further thinking (Smith, Rook, & Smith, 2007). Wiki technology in the classroom enables learners to deepen their thinking process.

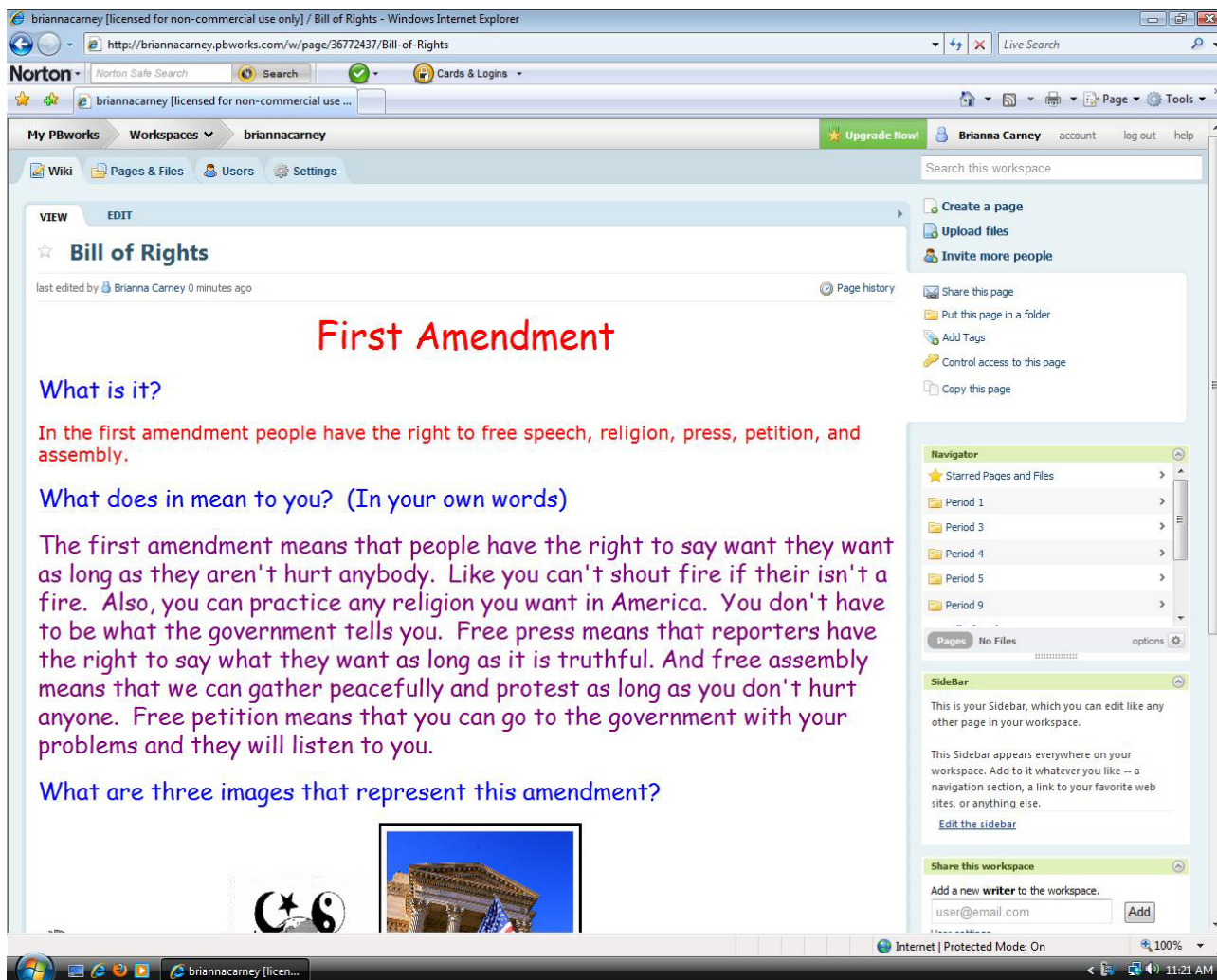


Figure 2.  
 JPEG of the Bill of Rights Wiki Page. This figure illustrates the Bill of Rights wiki project used in a social studies classroom through the PBWiki site.

Through wikis, students improve reading, writing, and discussion skills. Jewitt (2005) reasons that wikis progress literacy because wikis utilize multimedia, which provides learners with contextual clues to comprehend text. In addition, wikis assist students in interactive reading, which may motivate learners to read and help with comprehension of difficult text structures and vocabulary (McNabb, 2006). Wikis empower students by providing opportunities to express their ideas while encouraging reading, writing, reflection, and collaboration (Leight, 2008). After reading a text, students can add to the digital conversation by uploading their analysis and synthesis of the reading onto a classroom wiki (Kissel, Hathaway, & Wood, 2010). Wikis give students a voice and allow them to take responsibility for their own learning. Furthermore, wiki projects enable students to synthesize their views and ideas (Smith, Rook, & Smith, 2007). Through reading, writing, and discussion activities, educators can implement wikis into the learning environment through practical ways to promote collaborative classroom literacy.

Wikis can be used as a digital space for students to practice

literacy skills in content area classrooms. Figure 3 illustrates various ways that wikis can be integrated into content area classrooms.

For instance, wikis can be generated to explore vocabulary in a science course. Students can use the wiki to collaborate on the science vocabulary terms definition, synonyms, antonyms, and examples. Additionally, students can use wikis to brainstorm about various content area topics or ideas. Students can create graphic organizers and concept maps through wikis that help them organize their thoughts and ideas about a concept. For example, when solving a story problem in a math course, students can use wikis to create a graphic organizer that helps them share their ideas as they solve the problems. Learners can demonstrate math concepts through real-world applications using a wiki page. For example, in a lesson on geometric figures, students could upload images of real-life geometric figures using a wiki page. Learners could further share information by creating a content-based class newspaper. In a social studies course, students can create historical newspapers through a wiki page by adding news stories and graphics. Every



Social Studies	Math	Science	English
<ul style="list-style-type: none"> <li>Create wiki pages to explain the culture of country in a Geography course.</li> <li>Design a wiki newspaper page about a specific decade studies in an American History course.</li> <li>Debate and discuss constitutional issues in an American Government course.</li> <li>Produce wiki pages that depict a virtual trip to anywhere in the world in a Geography course.</li> <li>Use a wiki page to create a timeline of local history.</li> </ul>	<ul style="list-style-type: none"> <li>Craft digital stories on a wiki page that include math problems.</li> <li>Use a wiki page post pictures of geometrical figures and compare the figures in a Geometry course.</li> <li>Utilize a wiki page to describe real-world calculation of angles in a Geometry course.</li> <li>Design a wiki page to describe and evaluate complex math terms and operations.</li> <li>Collaboratively solve problems using a wiki page and compare methods to solving the problems.</li> </ul>	<ul style="list-style-type: none"> <li>Hold class debates and discussions about science-related controversial topics through a wiki page.</li> <li>Use wiki technology to map out and discuss difficult science terms or processes, such as the life cycle of a plant.</li> <li>Upload images on to a wiki page to categorize animals or plants.</li> <li>Apply wiki technology to collaboratively build lab reports.</li> <li>Utilize wikis to record observations from field sites, such as animal behavior at a lake or pond.</li> </ul>	<ul style="list-style-type: none"> <li>Use wiki as a place to peer edit each other's work.</li> <li>Upload short stories or poems they have written onto a wiki page to share with their peers.</li> <li>Compare characters or discuss plots or themes in a story using wiki technology.</li> <li>Utilized wikis as a brainstorming tool prior to writing.</li> <li>Employ wiki pages to construct sentence diagrams or identify different parts of speech.</li> </ul>

Figure 3.

*Ways to Integrate Wikis into Social Studies, Math, Science and English Classrooms. This figure illustrates specific examples of how wiki technology can be integrated into content area classrooms.*

student has an opportunity to contribute to the wiki page and enhance his or her content area literacy skills. Thus, wikis are a beneficial form of technology that can increase collaboration and literacy in a classroom.

Furthermore, wiki technology enhances language learning by providing students with opportunities to write and publish collaboratively (Twu, 2010). Research (Lund, 2008; Mak & Coniam, 2008; Wheeler & Wheeler, 2009; Zorko, 2009) found that wiki technology enhanced the development of writing skills for English as a Second Language (ESL) and High-Context Culture (HCC) students because wikis provide opportunities for creative, authentic, and collaborative writing. Twu

(2010) contends, "Language learning in wiki environments is more than just cognitive and mechanical interaction via reading, writing, and editing their own contributions and the contributions of others. The aim is to focus on the attitudes of students toward using Wikis and language learning tools" (p. 60). While research identifies some barriers to utilizing wiki technology as a language-learning tool (ex. technology challenges, lack of motivation or confidence, and reluctance to contribute), wikis support language learning through cooperative writing opportunities (Kessler, 2009; Matthew & Felvegi, 2009; Twu, 2010; Wheeler & Wheeler, 2009). Therefore, wikis can be used to break language barriers and establish a collaborative learning

environment.

### What Do Educators Need to Consider before Integrating a Wiki into the Curriculum?

Before integrating wikis into the classroom, educators should recognize specific curricular considerations. First, teachers should discuss proper posting etiquette with students (Duplichan, 2009). Even though accounts can be set to private, learners should understand that what they generate stays on the wiki for everyone to see. Students should understand that they are responsible for what they post. Second, educators need to decide how students' work on the wiki will be assessed and clearly outline the requirements of the work to be done for students.

Educators should develop rubrics evaluating learners for content and originality to help provide feedback to students (Duplichan, 2009). Figure 4 illustrates example criteria educators may use when evaluating wiki projects and activities in their content area classrooms.

Third, educators must recognize that these technologies can take on many forms (Luehmann & MacBride, 2009). The success or failure of wiki depends on the way the teacher structures the wiki and designs student activities. Finally, there is a concept as *too much technology*. Educators must consider if the wiki activity is appropriate for the learner objectives and if the students will benefit from the integration of technology. Any technology can be overused or used inefficiently and detract from student learning.

### Conclusion

As educators, we understand the significance technology plays on students' daily lives. Teachers should embrace technology and integrate it into the curricula where they see appropriate. However, not all teachers are equipped with the latest high-tech devices to accomplish this task. Fortunately, through free web technology such as wikis, teachers can integrate technology into their classroom in order to promote collaborative classroom literacy. Research (Marks, 2010) indicates that learning environments that enrich collaboration are beneficial

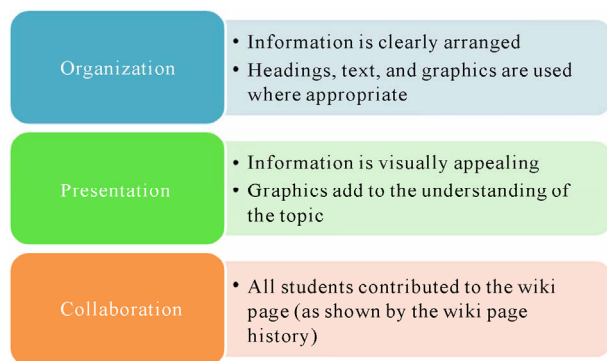


Figure 4.  
Wiki Page Assessment Criteria. This figure illustrates how educators can assess learners through the organization, presentation, and collaboration of their wiki page.

to student learning. Moreover, promoting classroom literacy provides learners with opportunities to participate in critical thinking, productive learning, and content retention (Smith, Rook, & Smith, 2007). Consequently, creating classroom environments that promote collaboration and literacy are crucial to student learning.

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