Perceptions of Using Web 2.0 Tools for Students with ADHD or the Tendencies of ADHD

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Diane A. Hill, M. Ed.

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This Master’s Research Project has been approved

for the Department of Teacher Education

Dianne M. Gut, Ph.D., Associate Professor, Special Education

Frans H. Doppen, Ph.D., Associate Professor and Chair of the Department of Teacher Education

☐ Checking this box indicates this document has been submitted and successfully cleared a plagiarism check. Supporting documentation has been provided to the Department Chair.
Abstract

This study was conducted to examine the perceptions teachers have of using Web 2.0 tools with students diagnosed with ADHD or students with ADHD tendencies. The study was also designed to determine if there was interest in professional development. The study focused on teachers who teach students who reside in an Appalachian county in Ohio. Educators from eight school districts were emailed a link to an online survey designed to answer questions such as: Are teachers in a mid-western Appalachian county in Ohio using Web 2.0 tools with their students? If so, do any of these students display ADHD symptoms? How would teachers rate the effectiveness of using blogs, wikis, or podcasts with students with ADHD? Why are more teachers not using blogs, wikis, podcasts, or other Web 2.0 tools in their classrooms? Can Web 2.0 tools such as blogs, wikis, and podcasts engage students with ADHD in learning? Can Web 2.0 tools be used in the assessment process? What are perceived benefits of using Web 2.0 tools with students with ADHD tendencies? Although the response rate was just over 15%, results show that overall; teachers perceive Web 2.0 tools as beneficial for students with ADHD or ADHD tendencies. Ninety-eight percent of teachers showed interest in professional development focused on implementing Web 2.0 tools in the educational process.
# Table of Contents

Abstract ...........................................................................................................................................3

Table of Contents .............................................................................................................................4

Introduction ........................................................................................................................................6

Literature Review ............................................................................................................................6

  - Definition of Attention Deficit Hyperactivity Disorder .................................................................6
  - Characteristics of Attention Deficit Hyperactivity Disorder .........................................................8
  - Strategies and Interventions for Attention Deficit Hyperactivity Disorder ..............................11
  - Current Research Relevant to Exceptionality ..............................................................................12

Web 2.0 ...........................................................................................................................................12

  - Blogs, wikis, and podcasts .............................................................................................................13

Challenges and Controversies ..........................................................................................................14

Summary .........................................................................................................................................15

Method ..........................................................................................................................................16

  - Participants ..................................................................................................................................16
  - Context .........................................................................................................................................16
  - Procedures ....................................................................................................................................17
  - Instrumentation .............................................................................................................................17

Results ............................................................................................................................................18

  - Demographics of Participants ....................................................................................................18
  - Use of Web 2.0 Tools .....................................................................................................................20
  - Perceived Benefits of Using Web 2.0 Tools with Students with ADHD Tendencies ..............22
  - Reasons Teachers Are Not Using Web 2.0 Tools with Students ............................................24
Intrinsic Motivation and Engagement of Students when Using Web 2.0 Tools ............ 26
Using Web 2.0 Tools as a Form of Assessment ..................................................... 27
Interest in Professional Development on Implementing Web 2.0 Tools ................. 27
Discussion .............................................................................................................. 30
Limitations ............................................................................................................. 32
Conclusion ............................................................................................................ 32
References ............................................................................................................ 33
Appendix ................................................................................................................ 36
This literature review, focuses first on attention deficit hyperactivity disorder, and then on Web 2.0 tools for use in the classroom. The goal was to look at studies in which students with ADHD used blogs, wikis, podcasts, and other Web 2.0 tools in the classroom. However, research was not yet found on the specific use of Web 2.0 tools such as blogs, wikis, and podcasts with students with ADHD. Some of the literature did include research on using Web 2.0 tools with students with disabilities.

**Literature Review**

**Definition of Attention Deficit Hyperactivity Disorder**

According to the American Psychiatric Association (2000), attention deficit hyperactivity disorder (ADHD) is described as a persistent pattern of inattention and/or hyperactive impulsivity. It is more frequent and severe than is typically observed in individuals at a comparable level of development. Individuals with attention deficit hyperactivity disorder have trouble maintaining attention, keeping control of their impulses, and are sometimes hyperactive. Even though many people without the disorder display some of the characteristics of ADHD, there must be a chronic pattern that occurs more often and to a higher degree than is normal for the individual to actually be diagnosed with an attention deficit hyperactivity disorder. ADHD can begin in infancy and last through adulthood. Because ADHD is defined by a set of behavioral observations, diagnosis is dependent on a history of symptoms including inattention, hyperactivity, and impulsivity that is persistent, pervasive, begins in the first decade of life, and causes significant impairment (Hoffman, 2009).

Attention deficit hyperactivity disorder is a very controversial condition because it is so often misunderstood. Many people think it is an excuse for the poor behavior displayed by some
children. Some people feel that individuals use a diagnosis of attention deficit hyperactivity disorder as justification for being lazy, disorganized, undisciplined, or problematic.

Attention deficit hyperactivity disorder is a real disorder with symptoms that provide challenges and frustrations for those affected. All individuals, to some extent, display some of the characteristics of attention deficit hyperactivity disorder, but for those with attention deficit hyperactivity disorder, these characteristics are stronger, more frequent, and occur repeatedly.

According to the American Psychiatric Association (2000), three subtypes of ADHD exist: predominantly inattentive type, predominantly hyperactive/impulsive type, and combined type. In the predominantly inattentive type, it is difficult for the person to get focused or stay focused on a task or activity. The predominantly hyperactive/impulsive type is characterized by the person being very active and often acting without thinking. The third type, which is the most common, is the combined type, where the person is inattentive, impulsive, and hyperactive.

According to the National Dissemination Center for Children with Disabilities (2010), as many as five percent of children in school may have attention deficit hyperactivity disorder, and boys are three times more likely than girls to have attention deficit hyperactivity disorder. This uneven ratio of boys to girls diagnosed with attention deficit hyperactivity disorder could be because girls are often not referred for testing or services until later in their development than boys, and girls' problems at the time of referral may be more complex or challenging because of the later referral (Soffer, Mautone, & Power, 2008). "Boys with ADHD may be rated as having a greater degree of symptoms and comorbid externalizing problems, whereas girls present with increased risk for intellectual and academic impairment, as well as internalizing disorders" (Soffer, Mautone, & Power, 2008, p. 18).
The exact cause of attention deficit hyperactivity disorder is unknown. Researchers are exploring possible causes such as hereditary contributions, neurological, and environmental factors. According to Gargiulo (2012), research shows that neurological dysfunction is a key factor in attention deficit hyperactivity disorder. Neuroscientists are able to use neuroimaging technology to learn about brain activity, and are seeing abnormalities in individuals with attention deficit hyperactivity disorder consistently showing up in several parts of the brain. "The acronym, “ADHD,” is a representation of the discipline of neurology, its wide recognition reflecting neurology’s substantial influence" (Rafalovich, 2001, p. 412). Chemical abnormalities in the brain are also being explored as a reason for ADHD. Specifically, some researchers think that attention deficit hyperactivity disorder could result from a deficiency of the neurotransmitter dopamine (Barkley, 1998).

Voeller (2004) suggests there are genetic and acquired forms of ADHD. It is a neuropsychiatric disorder in terms of etiology. "There is a genetic basis in about 80% of the cases, involving a number of different genes, and in about 20% of the cases, ADHD is the result of an acquired insult to the brain. Some individuals likely have both genetic and acquired forms" (Voeller, 2004, p. 798).

**Characteristics of Attention Deficit Hyperactivity Disorder**

The characteristics of individuals with attention deficit hyperactivity disorder are varied. The three main characteristics of those with attention deficit hyperactivity disorder are inattention, hyperactivity, and impulsivity. Anyone may display these characteristics from time to time, however, what separates those with and without ADHD is the frequency and duration of the behaviors associated with these characteristics.
Inattention can cause careless mistakes, difficulty staying on task, not listening when spoken to, not following through on instructions, failing to finish schoolwork, chores, or duties, difficulty organizing things that need to be done, not engaging in tasks that require sustained mental effort, losing items necessary for tasks, being forgetful, and easily distracted by things in the environment. Behaviors related to hyperactivity include fidgeting, not staying seated, running or climbing excessively, feelings of restlessness, difficulty playing quietly, constantly being in motion, and talking excessively. Impulsive behaviors include blurting out answers, difficulty waiting for their turn, interrupting conversations, or intruding on others (Gargiulo, 2012).

Actions and behaviors of children with attention deficit hyperactivity disorder can cause social problems. These children often have a hard time waiting their turn. They may interrupt people having a conversation, or blurt out answers to questions not directed to them. They often crowd in on other children’s play activities, or take their toys. Reckless actions are often made without thinking the action through or predicting what consequences might occur (Gargiulo, 2012).

Social and emotional problems may also develop because of bullying. Children with attention deficit hyperactivity disorder are bullied more often than those without (Wiener & Mak, 2009). Furthermore, according to Wiener and Mak, (2009) "children with ADHD were categorized as victims, bullies, and bully/victims significantly more often than were children without ADHD" (p. 116).

Additionally, adults may have difficulty with the social aspects of their lives. “The adult with ADHD often exhibits low self-esteem, anxiety, depression, sleep disturbances, difficulties with personal relationships and jobs, and impulsivity, which can lead to trouble with the law”
Many adults have relationship problems. Divorce rates are higher among couples that include at least one person with attention deficit hyperactivity disorder. Employers often complain that adults with attention deficit hyperactivity disorder cannot follow through with instructions or complete tasks, and frequently talk out of turn. According to Nadeau (2005), poor time management skills result in chronic lateness and missed deadlines; organizational problems lead to cluttered desks, misplaced paperwork, and difficulty in scheduling and prioritizing tasks. Difficulties with self-regulation and need for structure often make it difficult for the adult with ADHD to work well independently and complete complex, multistep tasks.

Emotional issues are also exhibited by persons with attention deficit hyperactivity disorder (Gargiulo, 2012). Aggression and anti-social behaviors are sometimes displayed. Some individuals with attention deficit hyperactivity disorder become withdrawn, depressed, or exhibit anxiety. Because of the severity of symptoms, individuals with attention deficit hyperactivity disorder often experience impaired functioning in daily life activities.

Although individuals with attention deficit hyperactivity disorder often experience other academic difficulties such as learning disabilities, some persons with ADHD are considered gifted. Attention deficit hyperactivity disorder does not affect the brain's ability to learn, it just affects the attention needed, or the availability of cognitive processes for learning to occur (Gargiulo, 2012).

**Strategies and Interventions for Attention Deficit Hyperactivity Disorder**

"One cannot expect a child to operate successfully in an academic environment if they are inattentive, disruptive and aggressive, and have problems with working memory, planning
and organization" (Daley & Birchwood, 2010, p. 456). There are many strategies and interventions that can be used for and by individuals with attention deficit hyperactivity disorder. Although, no two children with ADHD are alike, it is important to keep in mind that no single educational program will be best for all children (U.S. Department of Education, 2008b). No two adults with ADHD are alike either: therefore, strategies will also be different depending on their needs.

In the classroom, there are many things a teacher can do to help the child with ADHD be successful. Daley and Birchwood (2010) discussed several academic interventions that can be used with students. Peer and parent tutoring is a strategy where a student with ADHD is paired with a peer or parent tutor. Task/instructional modifications include manipulating tasks and instructions to meet the needs of the individual with ADHD.

An important aspect of instruction that is also beneficial for students with ADHD is classroom management procedures. Classroom functional assessment procedures result in the development of an intervention specific to the child. Self-monitoring is a process of setting individual goals for classwork completion and accuracy, monitoring goals, and administering rewards upon successful completion. Strategy training involves teaching specific skills that can be implemented to improve performance (Daley & Birchwood, 2010).

A teacher can also provide many different accommodations and strategies. To help a student for whom inattention is a problem, a teacher can seat the student in a quiet area; reduce the amount of homework; instruct the student in self-monitoring using cueing; allow extra time to complete assigned work; provide peer assistance in note taking; give clear, concise instructions; pair written instructions with oral instructions; assist the student in setting short-term goals; cue the student to stay on task; give assignments one at a time to avoid work
overload; and break long assignments into smaller parts so the student can see the end of his/her work (Gargiulo, 2012).

**Current Research Relevant to Exceptionality**

Much of the current research centers on adults with attention deficit hyperactivity disorder. In the past, ADHD was thought to be present mainly in children, however, recent studies have shown that ADHD has a 50% to 60% persistence rate into adulthood and may affect as many as seven million adults in the United States today (Wiita & Parish, 2008). With this new emerging evidence, it is logical that more research is being conducted in the area of ADHD in adults.

Other recent research has focused on the effects of different treatment options, including medications, behavioral treatments, and combination treatments. In 2007, the American Academy of Child and Adolescent Psychiatry issued new guidelines for the treatment of ADHD that again de-emphasized the role of behavioral management in favor of medication as the primary treatment for children with ADHD (Hoffman, 2009). Because this is a multifaceted disorder with significant developmental variations, it is necessary that testing various treatment options continues.

**Web 2.0**

Web 2.0 is a term used for a set of internet-based tools and an emerging philosophy on how to use them. The philosophy focuses on the idea that "the people who consume media, access the internet, and use the web shouldn't passively absorb what's available -- rather, they should be active contributors, helping customize media and technology for their own purposes, as well as those of their communities" (Krasne, 2005, p. 1). Web 2.0 tools enable users to create, edit, manipulate, and collaborate online (Handsfield, Dean, & Cielocha, 2009). According to
Hedberg and Brudvik (2008), "the social software supported in Web 2.0 enables consumers to become producers. Learners can contribute to the resources and not just consume them" (p. 140).

Some examples of Web 2.0 tools used in classrooms include blogs, wikis, and podcasts. Web 2.0 tools belong to all collaborators (Handsfield, Dean, & Cielocha, 2009). According to Solomon and Schrum (2007), Web 2.0 tools are explicitly designed for collaboration or manipulation of text. Web 2.0 technologies are presenting new opportunities for developing diverse online learning environments and enhancing interactivity, participation and feedback between students, their peer groups and teachers (Harrison & Thomas, 2009).

**Blogs, Wikis, and Podcasts**

Several studies have looked at the benefits of computer-assisted learning in literacy. Ducate and Lomicka (2008) examined the steps students went through while they participated as both readers and writers of blogs. As high school students progressed through the steps of blogging they became more comfortable with the process. The blogs promoted ownership and creativity and allowed students to express themselves in a relaxed environment. Students used blogs as a forum for expressing themselves and their opinions.

Cramer and Smith (2002) found that student writing improved with involvement in technology-rich instruction. In their study, they examined changes in writing achievement at the middle school level based on whether groups of students experienced a traditional language arts curriculum or participated in a technology-rich curriculum that included a specially designed unit which integrated language arts content and technology use. Two schools and seven language arts teachers took part in the study. Tarasiuk (2010), a teacher/researcher noticed her students struggled to complete classroom reading assignments because they considered them boring, but
that information and communication technology (ICT) engaged their interest. She began incorporating ICT into most of what her sixth, seventh, and eighth grade students did in class, through the use of wikis, digital book talks, and other digital media. Students began putting more effort into the work they completed.

MacArthur (2009) looked at the benefits and challenges that word processing, spell checkers, word prediction, speech recognition, outlining programs, concept mapping software, internet chat, blogs, multimedia, and wikis present to struggling writers. He found the two outcomes educators should be concerned with included the use of technological tools to help students develop effective writing skills, and the need to recognize that students need to learn how to access information and communicate effectively in the internet environment.

One study by Andes and Claggett (2011) involved a special project called “A Writing Community” where students with special needs used wikis for writing lessons. The goal was to improve the written expression skills of students receiving special education and Title I services. Improving vocabulary and language development was targeted, and technology was the conduit and motivator. Students took part in meaningful projects, and were therefore motivated to read and write. Results were positive as students went from working below grade level to 50% working at or above grade level (Andes & Claggett).

Challenges and Controversies

One challenge that studies have found is that the digital divide needs to be closed between teachers, educational systems, and students. Today's generation of students has grown up in a digital age of information processing and most teachers have not had the same opportunity (Mullen & Wedwick, 2008).
Another issue is safety. Just how safe is the internet? Many administrators, parents, and teachers do not want their students on the internet because of online predators. One blog project ran into difficulties when a student made reference to his community. The administrators stopped the online project citing safety concerns (Witte, 2007).

Internet filtering, or filtering software specifically used to protect minors from questionable material on the web, is yet another controversy. This software filters questionable material like pornography, hate group ideology, and graphic images by not allowing individuals to visit sites that might contain such content (Meeder, 2005). Meeder feels that "classroom practitioners have a much better sense of what is best for their students than do a group of software engineers working for a corporate software manufacturer" (p. 58). Some schools even filter access to blogs, wikis, and podcasts.

**Summary**

After conducting an extensive review of existing literature regarding both Attention Deficit-Hyperactivity Disorder and Web 2.0 tools, such as blogs, wikis, and podcasts, it seems there is a hole in the literature. Research was not found on the impact of using Web 2.0 tools with children displaying ADHD symptoms. The researcher conducted informal interviews with an intervention specialist and language arts teachers at the middle school level. It seems that many teachers are not using this technology in their classrooms which leads to the following questions. Are teachers in a mid-western Appalachian county in Ohio using Web 2.0 tools with their students? If so, do any of these students display ADHD symptoms? How would teachers rate the effectiveness of using blogs, wikis, or podcasts with students with ADHD? Why are more teachers not using blogs, wikis, podcasts, or other Web 2.0 tools in their classrooms? Can Web 2.0 tools such as blogs, wikis, and podcasts engage students with ADHD in learning? Can
Web 2.0 tools be used in the assessment process? What are perceived benefits of using Web 2.0 tools with students with ADHD tendencies?

**Method**

The participants in this study responded to an online survey designed using Qualtrics, an online survey tool. The survey was designed to determine teachers’ perceptions of the impact of web 2.0 tools on the motivation of students diagnosed with ADHD. Survey responses provided insights into the reasons teachers are or are not using web 2.0 tools in the process of educating students with ADHD or those displaying ADHD tendencies.

**Participants**

Special education teachers, general education teachers, and administrators from three school districts that enroll students in an Appalachian County in rural Ohio completed an online survey. Approximately 705 educators from three local school districts were sent an email from their school district superintendent requesting their participation in this research. The selected school districts included rural, village, and city schools, and consisted of elementary, middle, and high school teachers. The email included a link to an online survey. The teachers from the selected school districts included both general education teachers and special education teachers.

**Context**

According to the U. S. Census Bureau’s 2010 data, the Appalachian county where the survey took place has a population of approximately 78,064. Twenty-two percent of the population is under 18 years of age, and 14.3% of the population is over 65 years of age. Approximately 48% of the population is female. Approximately ninety-one percent of the population is white, and 6% are black. Approximately two percent of the population comes from two or more races, and one percent of the population is Hispanic. Approximately 84% of
persons 25 years of age or older are high school graduates, and 14% have a bachelor’s degree or higher. There is an average of 2.54 persons per household, and the median household income is $44,577. Seventeen and one half percent of the people in the county are living below the poverty level. There are 28,158 households in the county, with approximately 113.3 persons per square mile.

**Procedures**

After official approval was granted by Ohio University’s Office of Research Compliance, a survey was created through Qualtrics, an online survey program. County and District superintendents provided permission to allow their educational staff to participate in the study. An invitation to participate in the research was emailed to all staff, via each district’s superintendent. The email contained a link to the online survey, and by clicking on the link, participants agreed to the conditions outlined in the consent form. One week later, a reminder email was sent again inviting recipients to participate. The survey was closed two weeks later, and the survey data was aggregated through the Qualtrics’ survey program.

**Instrumentation**

An online survey was used for data collection for this study. The survey included questions that determined the demographics of the participants, and questions that were designed to investigate educators’ perceptions and attitudes regarding the use of web 2.0 tools in the education of students with ADHD or students displaying ADHD tendencies. The survey was designed to be able to disaggregate answers from participants who had used web 2.0 tools with their students, and those who had not. All participants taught students diagnosed with or displaying ADHD tendencies. The complete survey can be found in the appendix.

**Results**
The following section describes the responses of 107 participants who answered the questions presented in the survey designed to gather teachers’ perceptions of using Web 2.0 tools with students with ADHD or those displaying the tendencies of ADHD. Responses indicate that all 107 participants taught students with ADHD tendencies.

**Demographics of Participants**

The educators’ length of service in education ranged from one to more than thirty years. Eighty-six percent of the educators had a master’s degree, and one participant had a Ph.D. Eighty-eight of the participants taught in inclusive classrooms, sixteen taught in a resource room, and one teacher taught in a virtual classroom. Tables 1 through 7 summarize the demographics of the survey participants.

Table 1

*Gender of Participants*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>33</td>
<td>31%</td>
</tr>
<tr>
<td>Female</td>
<td>74</td>
<td>69%</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2

*Age of Participants*

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>10</td>
<td>9%</td>
</tr>
<tr>
<td>30-39</td>
<td>26</td>
<td>24%</td>
</tr>
<tr>
<td>40-49</td>
<td>33</td>
<td>29%</td>
</tr>
</tbody>
</table>
### Table 3

**Level of Education**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s</td>
<td>14</td>
<td>13%</td>
</tr>
<tr>
<td>Master’s</td>
<td>92</td>
<td>86%</td>
</tr>
<tr>
<td>PH.D.</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>107</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### Table 4

**Number of Years in the Education Field**

<table>
<thead>
<tr>
<th>Years</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>13</td>
<td>12%</td>
</tr>
<tr>
<td>6-10</td>
<td>20</td>
<td>19%</td>
</tr>
<tr>
<td>11-20</td>
<td>42</td>
<td>39%</td>
</tr>
<tr>
<td>21-30</td>
<td>22</td>
<td>21%</td>
</tr>
<tr>
<td>30+</td>
<td>10</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>107</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Table 5

*Type of School District*

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>51</td>
<td>48%</td>
</tr>
<tr>
<td>County</td>
<td>18</td>
<td>17%</td>
</tr>
<tr>
<td>Exempted Village</td>
<td>38</td>
<td>35%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>107</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 6

*Grade Levels Taught*

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-2</td>
<td>19</td>
<td>18%</td>
</tr>
<tr>
<td>3-5</td>
<td>26</td>
<td>24%</td>
</tr>
<tr>
<td>6-8</td>
<td>39</td>
<td>36%</td>
</tr>
<tr>
<td>9-12</td>
<td>44</td>
<td>41%</td>
</tr>
</tbody>
</table>

Table 7

*Subjects Taught*

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading/Lang. Arts</td>
<td>53</td>
<td>51%</td>
</tr>
<tr>
<td>Math</td>
<td>42</td>
<td>41%</td>
</tr>
<tr>
<td>Science</td>
<td>31</td>
<td>30%</td>
</tr>
<tr>
<td>Social Studies</td>
<td>31</td>
<td>30%</td>
</tr>
</tbody>
</table>
Use of Web 2.0 Tools

One hundred three of the participants responded to the question, “Have you ever used web 2.0 tools (blogs, wikis, podcasts, animated videos, etc.) with your students?” Fifty-five percent of the participants reported having used web 2.0 tools with their students in the educational process, while 45% of them had not. Of the participants listing tools they had used with their students, the most common web 2.0 tool used was animated videos (website application that allows the user to create computer animated stories to create, tell, adjust, or replay existing stories, give introductions to different units, or to explain problems and solutions) with 18 participants saying they had used this tool with their students. Twelve participants had used blogs (website application which allows a user to record opinions, information, etc. on a regular basis). Four participants had used Prezis (web-based presentation tool that uses a map layout and zooming instead of traditional slides), and four participants had used podcasts (multimedia digital files that are made available for downloading on the internet) with their students.

Perceived Benefits of Using Web 2.0 Tools with Students with ADHD Tendencies

Fifty-one participants responded to the question, “What do you see as benefits of using Web 2.0 tools for your students with ADHD tendencies?” Seven options were provided to the participants. Options included improved learning, collaboration, ability to create, ability to contribute, connecting with other students, participation in a learning community, and other. The participants could choose more than one option. Table eight summarizes this information.
Table 8

*Perceived Benefits of Using Web 2.0 Tools (Teachers Who Have Used Web 2.0 Tools)*

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Learning</td>
<td>40</td>
<td>78%</td>
</tr>
<tr>
<td>Participation in Learning Community</td>
<td>33</td>
<td>65%</td>
</tr>
<tr>
<td>Connecting with Other Students</td>
<td>30</td>
<td>59%</td>
</tr>
<tr>
<td>Ability to Contribute</td>
<td>26</td>
<td>51%</td>
</tr>
<tr>
<td>Ability to Create</td>
<td>21</td>
<td>41%</td>
</tr>
<tr>
<td>Collaboration</td>
<td>19</td>
<td>37%</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>12%</td>
</tr>
</tbody>
</table>

*Other* responses included two participants stating that students are more engaged, and one participant responded that the ability to receive immediate feedback was a benefit of using Web 2.0 tools. When participants were asked what they felt the greatest benefit to using Web 2.0 tools with students with ADHD students the majority stated that they keep the students’ attention and that they are engaging.

Thirty-six participants that had not used Web 2.0 tools with their students answered the question, “Do you think any of the following would be benefits of using Web 2.0 tools with students with ADHD tendencies?” These participants had the same choices as the participants who had used Web 2.0 tools, along with two additional choices: student engagement, and intrinsic motivation. The vast majority chose *student engagement*, and 14% chose *other*. The five respondents who chose *other* did not elaborate on what the other benefits were. Table 9 summarizes this information.
Table 9

*Perceived Benefits of Using Web 2.0 Tools (Teachers Who Have Not Used Web 2.0 Tools)*

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Engagement</td>
<td>29</td>
<td>81%</td>
</tr>
<tr>
<td>Improved Learning</td>
<td>21</td>
<td>58%</td>
</tr>
<tr>
<td>Connecting with Other Students</td>
<td>19</td>
<td>53%</td>
</tr>
<tr>
<td>Intrinsic Motivation</td>
<td>19</td>
<td>53%</td>
</tr>
<tr>
<td>Ability to Create</td>
<td>17</td>
<td>47%</td>
</tr>
<tr>
<td>Collaboration</td>
<td>15</td>
<td>42%</td>
</tr>
<tr>
<td>Ability to Contribute</td>
<td>14</td>
<td>39%</td>
</tr>
<tr>
<td>Participation in Learning Community</td>
<td>10</td>
<td>28%</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>14%</td>
</tr>
</tbody>
</table>

*Reasons Teachers Are Not Using Web 2.0 Tools with Students*

A question asked participants who used Web 2.0 tools with their students to explain why they are not using Web 2.0 tools more often. There were ten choices they could choose from, including the choice of *other*. Participants could choose more than one reason. Sixty-nine percent said that they don’t use these tools more often because many of their students don’t have internet access at home. Sixty-five percent don’t use these tools more often because there are not enough computers, iPads, etc. in their classrooms. Thirty-five percent don’t feel confident using this technology because of their lack of knowledge concerning Web 2.0 tools. Twenty-five percent of the subgroup felt they didn’t have time to implement the use of Web 2.0 tools. Twenty-three percent say that internet access to many of these tools is blocked by their
technology departments. Thirteen percent chose the lack of control over student use, including supervision and censorship as issues. Two percent chose privacy and safety issues as a reason, and two percent said they don’t see value in using these tools. Two percent of the participants chose other, but did not explain what other reasons they had for not using Web 2.0 tools more often. Figure 1 summarizes this information.

Figure 1. Reasons teachers who have used Web 2.0 are not using these tools more often.

A similar question, “What are the reason(s) that keep you from using Web 2.0 tools with your students?” was asked of the participants who had not previously used Web 2.0 tools with their students. Fifty-seven percent of the participants said that they were not aware of this technology, and fifty-seven percent also said that there are not enough computers, iPads, etc. in their classrooms. Thirty-seven percent said that many of their students did not have access to the internet at home. Thirty-five percent said that they don’t know how to use this technology. Twenty percent felt they don’t have time to implement these tools, and fifteen percent chose lack of control over student use as a reason. Thirteen percent said that internet access to many of these tools is blocked by their technology departments. Seven percent have no interest in using these tools with their students, while two percent chose privacy and safety issues as reasons they
don’t use these tools with their students. Two percent of the participants saw no value in using these tools, and two percent chose other, but did not explain what the other reasons were. Figure 2 summarizes this information.

Figure 2. Reasons teachers who have not used Web 2.0 tools with their students are not using these tools.

Intrinsic Motivation and Engagement of Students when Using Web 2.0 Tools

Participants who had used web 2.0 tools with their students were asked if their students with ADHD tendencies seemed intrinsically motivated when they were permitted to use web 2.0 tools. A majority, 92%, replied yes to this question. Eight percent stated that their students with ADHD tendencies did not seem intrinsically motivated when they were permitted to use web 2.0 tools.

Participants were also asked if their students with ADHD tendencies were engaged in the learning process when using web 2.0 tools. The majority of participants, 92%, also replied yes to this question. Eight percent stated that their students with ADHD tendencies were not engaged in the learning process when using web 2.0 tools.

Using Web 2.0 Tools as a Form of Assessment
Sixty-five percent of 48 respondents said they had not used web 2.0 tools for assessment purposes. Of the thirty-five percent who had used web 2.0 in the assessment process, 76% felt that it had been a valid form of assessment. Twenty-four percent of the 17 respondents who had used web 2.0 tools in the assessment process felt that it was not a valid form of assessment.

**Interest in Professional Development on Implementing Web 2.0 Tools**

Participants were asked how interested they would be for their schools to offer professional development on implementing web 2.0 tools in the educational process. Of those teachers who had not used web 2.0 tools with their students with ADHD tendencies, all respondents were interested. On a scale of 1 to 10 (with 1 being the least interest and 10 being most interest), 83% of the respondents chose a level of five or above (five being moderately interested). Of the teachers who had used web 2.0 tools with their students with ADHD tendencies, 87% chose a level of five or above. Tables 10 and 11 summarize this information.

**Table 10**

*Interest for Professional Development (Teachers who had not used web 2.0 tools with students)*

<table>
<thead>
<tr>
<th>Interest Level</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>4%</td>
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<tr>
<td>2</td>
<td>2</td>
<td>4%</td>
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<td>2%</td>
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<td>7%</td>
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<td>4%</td>
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<tr>
<td>6</td>
<td>3</td>
<td>7%</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>9%</td>
</tr>
</tbody>
</table>
## Table 11

*Interest for Professional Development (Teachers who had used web 2.0 tools with students)*

<table>
<thead>
<tr>
<th>Interest Level</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0%</td>
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<tr>
<td>5</td>
<td>8</td>
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<td>6</td>
<td>5</td>
<td>13%</td>
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<td>10%</td>
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<tr>
<td>9</td>
<td>3</td>
<td>8%</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Discussion

The purpose of this research was to determine if teachers who taught students who resided in an Appalachian county in Ohio felt that web 2.0 tools increased motivation and engagement of students with ADHD or the tendencies of ADHD. After completing a review of literature that indicated Web 2.0 tools can increase motivation and engagement of students, and talking to teachers in mid-western Appalachian county schools in Ohio, the researcher felt that Web 2.0 tools could increase motivation and engagement of students with ADHD or ADHD tendencies. The results of this study support this hypothesis.

The overwhelming majority of participants saw value in using Web 2.0 tools. One hundred seven educators participated in the study, and the majority of participants had used Web 2.0 tools with their students. Of the teachers who had used Web 2.0 tools with their students, only one stated they saw no value in using these tools with students with ADHD tendencies. Of the 45% who had not used Web 2.0 tools, only one thought there was no value in using these tools with students with ADHD tendencies.

Almost all of the teachers saw student engagement as a benefit. Twenty-nine of thirty-six teachers who had not used Web 2.0 tools with their students chose student engagement as a benefit of using Web 2.0 tools with students with ADHD tendencies, and 47 of 48 teachers who had used Web 2.0 tools with students with ADHD tendencies stated that students are engaged in the learning process when using Web 2.0 tools. Many teachers listed student engagement as the greatest benefit of using Web 2.0 tools with students with ADHD tendencies.

Many participants also perceived intrinsic motivation as a benefit of Web 2.0 tools for students with ADHD tendencies. Forty-four of forty-eight participants said their students with ADHD tendencies were intrinsically motivated when using Web 2.0 tools. The majority of those
teachers who had not used Web 2.0 tools felt that students with ADHD tendencies would be intrinsically motivated while using Web 2.0 tools.

Only 17 teachers had used Web 2.0 tools as a form of assessment with students with ADHD tendencies, but of those 17, 76% thought it was a valid form of assessment. Perhaps if more teachers were aware of how to use Web 2.0 tools in the assessment process, more teachers would institute this practice.

All of the participants showed interest in professional development focused on implementing Web 2.0 tools in the educational process. The participants rated their interest on a scale of one to ten with one being the least interest and ten being the greatest interest. Seventy-two of eighty-six teachers who responded to this question rated their interest at a five or above. This shows that there is much interest in learning to use these tools.

Based on the findings of this study, the majority of teachers see value in using Web 2.0 tools. Ninety-two percent of teachers who have used Web 2.0 tools feel that students with ADHD tendencies are engaged and intrinsically motivated when using Web 2.0 tools, therefore using these tools would be a way to help those individuals with ADHD who have trouble maintaining attention. Many teachers are not using this technology because they are not sure how to implement it in the educational process, or they perceive other barriers in its implementation. A recommendation would be for teachers in these districts to seek professional development on implementing Web 2.0 tools with their students, including strategies for implementing these tools with students with ADHD tendencies, and strategies for using these tools in the assessment process.

A recommendation for school districts is for the technology departments to provide access to websites that provide Web 2.0 tools for teachers who want to use these tools. Another
recommendation would be for districts to provide high quality professional development on the use of Web 2.0 tools for students with ADHD tendencies. Professional development should include the use of these tools for assessment purposes.

Future research should include interviewing or surveying students with and without ADHD tendencies on their perceptions of the use of Web 2.0 tools in the educational process. Future research should also include a study of the use of Web 2.0 tools with students both with and without ADHD to observe the effects of Web 2.0 tools on learning. Future research should also include a study to measure the engagement level of students with ADHD tendencies while using Web 2.0 tools.

**Limitations**

This study does have limitations. One limitation was the definition of Web 2.0 tools. Some participants expressed concern that they weren’t sure which internet programs were considered Web 2.0. Another limitation was the difficulty of obtaining complete surveys. Some participants chose not to answer some questions.

**Conclusion**

Web 2.0 tools can be a way to capture the attention of and engage a student with ADHD tendencies, and teachers perceive benefits for their students when using these tools. The researcher strongly believes that the learning environment should include 21st Century tools that engage the learner. Using Web 2.0 tools can enhance the learning experience of students with ADHD tendencies. It is imperative that professional development be available for teachers to achieve the maximum benefit of the implementation of Web 2.0 tools in the education of students with ADHD tendencies.
References


doi:10.1080/00405840801992363


Tarasiuk, T. J. (2010). Combining traditional and contemporary texts: Moving my English
class to the computer lab. *Journal of Adolescent & Adult Literacy, 53*(7), 543-552.


Appendix

Question 1  Gender

☐ Male

☐ Female

Question 2  Age

☐ 20-29

☐ 30-39

☐ 40-49

☐ 50-59

☐ 60-69

☐ 70-79

Question 3  Highest Degree Completed

☐ Bachelor's

☐ Master's

☐ Ph.D.
Question 4  How many years have you taught?

☐ 0-5

☐ 6-10

☐ 11-20

☐ 21-30

☐ 30+

Question 5  Setting where you teach:

☐ General Education Classroom

☐ Resource Room

☐ Virtual Classroom

Question 6  Grade level that you teach (choose all that apply):

☐ K-2

☐ 3-5

☐ 6-8

☐ 9-12

Question 7  Type of district where you currently work:

☐ City

☐ County

☐ Exempted Village
Question 8  Type of teaching position held:

☐ General Education

☐ Special Education

Question 9  Subject area(s) you currently teach (choose all that apply):

☐ Reading/Language Arts

☐ Math

☐ Science

☐ Social Studies

☐ Other

Question 10  Number of students you are responsible for teaching in a typical day:


Question 11  Have you ever taught students who were diagnosed with or displayed the tendencies of Attention Deficit Hyperactivity Disorder ADHD)?

☐ Yes

☐ No

If no is chosen, this ends the survey.

Question 12  Estimated number of students you have worked with in the past that have been diagnosed with ADHD or have displayed tendencies of ADHD:


Question 13  Have you ever used web 2.0 tools (blogs, wikis, podcasts, animated videos, etc.) with your students in the educational process?

☐ Yes

☐ No

(If yes is chosen on question 13, questions 14-22 are displayed)

(If no is chosen on question 13, questions 23-25 are displayed)

Question 14  Please list the web 2.0 tools you have used with your students.

Question 15  What do you see as benefits of using web 2.0 tools for your students with ADHD tendencies? (Choose all that apply.)

☐ Improved learning

☐ Collaboration

☐ Ability to create

☐ Ability to contribute

☐ Connecting with other students

☐ Participation in a learning community

☐ Other

Please explain "other" benefits you see in using web 2.0 tools with students who display ADHD tendencies.

Question 16  What do you feel is the greatest benefit of using web 2.0 tools with students who display ADHD tendencies?
Question 17  Do your students with ADHD seem intrinsically motivated when they are permitted to use web 2.0 tools? (Do they show interest in, and enjoy assignments when they are permitted to use web 2.0 tools?)

☐ Yes

☐ No

Question 18  Are your students with ADHD tendencies engaged in the learning process when using web 2.0 tools?

☐ Yes

☐ No

Question 19  Have you ever used web 2.0 tools as a form of assessment for students displaying ADHD tendencies?

☐ Yes

☐ No

Question 20  Do you feel this was a valid form of assessment?

☐ Yes

☐ No
Question 21  What are the reason(s) that keep you from using web 2.0 tools more often with your students? (Check all that apply.)

☐ I don't feel confident using this technology because of my lack of knowledge concerning web 2.0 tools.

☐ I don't see value in using these tools.

☐ Internet access to access many of these tools is blocked by the technology department.

☐ I don't have time to implement these tools.

☐ There are not enough computers, iPads, etc. in my classroom.

☐ Many of my students do not have Internet access at home.

☐ Lack of control over student use (supervision, censorship).

☐ Privacy and Safety issues

☐ I have no interest in using these tools with my students.

☐ Other

Please explain "other" reasons for not using web 2.0 tools more often with your students.
Question 22

How interested would you be for your school to offer professional development on implementing web 2.0 tools into the educational process?
Question 23  Do you think any of the following would be benefits of using web 2.0 tools with students with ADHD tendencies? (Choose all that apply.)

☐ Improved learning

☐ Collaboration

☐ Ability to create

☐ Ability to contribute

☐ Connecting with other students

☐ Participation in a learning community

☐ Student engagement

☐ Intrinsic motivation

☐ Other

Please explain "other" benefits you see in using web 2.0 tools with students who display ADHD tendencies.
Question 24 What are the reason(s) that keep you from using web 2.0 tools with your students?

(Choose all that apply.)

☐ I wasn't aware of this technology.

☐ I don't know how to use this technology.

☐ I see no value in using these tools.

☐ Internet access to access many of these tools is blocked by the technology department.

☐ I don't have the time to implement these tools.

☐ There are not enough computers, iPads, etc. in my classroom.

☐ Many of my students do not have Internet access at home.

☐ Lack of control over student use (supervision, censorship).

☐ Privacy and Safety issues

☐ I have no interest in using these tools with my students.

☐ Other

Please explain "other" reasons for not using web 2.0 tools with your students.
Question 25

How interested would you be for your school to offer professional development on implementing web 2.0 tools into the educational process?