Techniques and Tools:

Effectiveness of Research-based Pedagogical Techniques through

Online Learning Tools with Secondary Students

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**Abstract**

With the rapid growth of the online learning environment (OLE), many teachers face the challenge of teaching effectively in this new environment. This study examined online secondary teachers’ opinions of the effectiveness of various researched-based pedagogical techniques (RPT) implemented through online learning tools on student participation, academic achievement, and satisfaction. The purpose is to help teachers improve how they may use online learning tools effectively for RPT application. The data were collected through an online survey distributed to participants in the fall of 2014. The findings showed that online secondary teachers most frequently used the online learning tools blogs, discussion boards, and interactive tutorials/modules. Wikis, virtual worlds, and social network sites were rarely used in online secondary classes and had the most reported barriers for use. Not seeing the potential of the online learning tool was found to be the most common barrier, along with the inability of a course management software (CMS) to implement a tool. This study concludes that there are generally positive relationships between online learning tools with RPT and student participation, academic achievement, and satisfaction in online secondary courses. Online secondary teachers need training and support to implement tools with RPT found effective in literature. It is recommended that more research be conducted to look at the relationship between the effectiveness, frequency of use, and barriers, as well as examine how other participant demographics may impact the data.

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**Chapter 1: Introduction**

**Introduction and Background**

 Given that more than a million secondary students in the United States take online courses each year (Journell, McFadyen, Miller, & Brown, 2014), it is vital for research to explore how research-based pedagogical techniques (RPT) can be implemented successfully through online learning tools with this student population. Online learning environments (OLE) have made a significant impact on learning theories due to it shifting the responsibility of learning to the student. With K-12 education expanding into OLE, there is a new category of teachers facing the challenging task of teaching effectively in this environment. There is also an ever-growing selection of online learning tools that can support RPT for OLE, but teachers face challenges to implement them effectively in their classes. They need to identify and utilize the most effective tools in order to help all students succeed in the unique learning paradigm of OLE. This study reviewed learning theories that can be effective in OLE in order to select appropriate online learning tools for desired learner outcomes in secondary online students. The purpose of this study is to provide information that teachers can use when deciding which tools to implement RPT in OLE for secondary students. This research study examined online secondary teachers’ views of RPT effectiveness of selected online learning tools on student participation, academic achievement, and satisfaction; the frequency with which they used the tool; and the barriers that hindered them from using the tool. Data were collected through an online survey distributed to participants in the fall of 2014.

**Statement of the Problem**

Utilizing online learning tools to effectively teach students with RPT in OLE can seem like an overwhelming task for secondary teachers. Research has found strong links between courses that effectively use technology tools and student outcomes (Alghamdi, 2013; Ang, Anvi, & Zaphiris, 2008; Casey & Evans, 2011; Freidhoff, 2008; Hewege & Perera, 2013; Im & Lee, 2004; Joshi & Babacan, 2012; Lee & Osman, 2012; McNeill & Fry, 2012; Sammel, Weir, & Klopper, 2013; Schiller, 2009; Skagen et. al, 2008; Twining, 2009). This same literature documented the plethora of tools available for teacher use in OLE courses as each study typically explored only one tool. Combine that with the rapid growth of technology, online teachers face the intimidating task of choosing which tool to implement and how to use them in their courses.

Furthermore, research has focused on post-secondary students (Alghamdi, 2013; Doering, Veletsianos, Scharber, & Miller, 2009; Edwards, Perry, Janzen, & Menzies, 2012; Hadjerrouit, 2012; Hazari, North, & Moreland, 2009; Im & Lee, 2004; McNeill & Fry, 2012; Journell, 2014, Sammel et al., 2013; Schiller, 2009) rather than secondary students (Casey & Evans, 2009; Lee & Osman, 2012; Twining, 2009). This begs the question if online learning tools that are effective with adult learners would be effective with younger students.

By examining what other online secondary teachers have implemented effectively in OLE, teachers can obtain a better understanding of how online learning tools can be used effectively. By examining multiple tools and their impact on student participation, academic achievement, and satisfaction, teachers can read a concise resource rather than research each tool separately. With this understanding, teachers can make informed decisions about what online learning tools to implement RPT through in order to impact student participation, academic achievement, and satisfaction.

**Purpose of this Study**

The purpose of this study was to investigate how frequently online secondary teachers use selected online learning tools to implement RPT and examine their views on the effectiveness of tool use on chosen learner outcomes. This study also sought to gain more information about why teachers may not be using certain online learning tools in their OLE course in order to offer suggestions that may help schools and teachers be more intentional in their choice of online learning tool use. This study assumed that teachers would implement RPT through the tools that positively affect student participation, academic achievement, and satisfaction if they knew which tools would aide in these areas. Essentially answering the question: “What can we do in OLE to get students to participate, get better grades, and be happy with the course?”

**Outcome Categories.**

Student participation was chosen because being actively engaged in learning has shown to be a contributing factor to knowledge attainment. Casey & Evans (2011) found the use of social network sites to increase participation (both in the amount of the questions asked and the feedback given), connection to classmates, and even audience scope (both to write to and receive feedback from). Successful RPT implementation through online learning tools should show an increase in active student participation in course assignments or projects, thereby having a positive affect on learning in OLE.

Academic achievement was chosen because it is an indicator of successful knowledge construction. Sammel, Weir, and Klopper (2014) stressed that in order for tools to have a positive impact on learner outcomes, they must be carefully chosen to meet the needs and goals of the course. Retaining more content material, building connections, and applying new knowledge to assessments, are indicators of online learning tools’ success in implementing RPT in OLE.

Satisfaction was chosen because OLE is a new learning environment that will only stand the test of time if learners are happy with the outcomes they attained through it. Freidhoff (2008) argued that any technologies or tools implemented into coursework should be considered for student sustained use and application to future work for satisfaction reasons. If students are dissatisfied with learning outcomes or the experience of OLE, it is assumed that they will be unlikely to continue education through these means.

**Definition of Terms**

* Online learning environments (OLE), also referred to as online learning, e-learning, or web-based learning, is a form of distance learning that can be accessed from any device with internet access. A course management system (CMS) or learning management system (LMS), such as Moodle or Blackboard, is typically used to present a standard platform for courses within a school. Online courses at their core have four components: presentation of materials through the use of the world-wide web, interaction occurring in the virtual world, the ability for teachers to monitor student progress, and online assessments (Hazari et al., 2009).
* Online learning tools are defined as any software, online tool, or service that can be used for learning, teaching, training, or creating e-learning (Hart, 2014). They can also be technology that encourages participatory approaches in which users become active participants and producers of content (Hazari et al., 2009).

**Chapter 2: Review of the Literature**

**Introduction**

The online learning environment (OLE) is an exceptional tool for teachers to potentially reach each student at their own educational level. But in order to utilize OLE to its fullest potential, teachers need to know which research-based pedagogical techniques (RPT) can be used effectively in this environment, as well as which online learning tools support the specific learning paradigm applicable here. Many techniques and tools can be and have been used in OLE. Teachers cannot possibly implement all of them effectively. That is why it is vital for teachers to identify the most effective pedagogical techniques and online learning tools in order to help all students succeed. This literature review will examine previous research on the use of various techniques and tools used in OLE. It will begin by exploring the basics of OLE. It will then present the learning theories that support effective pedagogical techniques for OLE. It will conclude with an exploration into any barriers that research has revealed may hinder the use of some of these tools in OLE.

**Basics of Online Learning Environments**

In order to evaluate the effectiveness of applying RPT through online learning tools on student participation, academic achievement, and satisfaction, it is important to have a foundational understanding of OLE. Online learning, also referred to as e-learning, at its core has four components: presentation of materials through the use of the world-wide web, interaction occurring in the virtual world, the ability for teachers to monitor student progress, and online assessments (Hazari et al., 2009). There are numerous ways in which each of these components can occur.

The advantages of OLE have been discussed in many studies: engagement, interactive format, fostering collaboration, building social connection, and expanding beyond the formal classroom environment (Hazari et al., 2009). Alghamdi (2013) praised online learning for: “individualized learning experience that fulfills the education needs of students with different learning styles”; “flexibility in terms of time and place”; “ease in which the information provided can be continuously modified, thus helping to make learning more enjoyable and individualized”; as well as “emerging as ‘a practical necessity in the realization of relevant, meaningful, and continuous learning’” (p. 68). As Casey and Evans (2011) put it, “new technologies have the potential to allow students to ‘speak’ to a world far beyond their local community” (p. 1) and “they empower students to write and publish for a global audience, encouraging them to be more than just the audience” (p. 2).

Within OLE, learning tools and technology permeate the discussion. Essentially, online learning tools offer sharing of content. Text, graphics, audio, and video become sources of information in the online world. Others draw on these to create their own knowledge, share with orders, and expand the knowledge base. Knowledge creation is made possible by the shared access to knowledge already generated by others. Hazari, North, and Moreland (2009) stated, “online learning environments that include technology tools can develop higher order learning and critical thinking in students” (p. 190). It is these learning tools that allow teachers to utilize research-based pedagogical techniques. Churches (2009) emphasized, “It is not about the tools, it’s using the tools to facilitate learning” (p. 1).

The same learning tool can be used in a variety of ways and classrooms, across ages and content areas. Because of this, tools need to be chosen with care in order to facilitate learning. Halawi, McCarthy, and Pires (2009) explained that Bloom’s taxonomy was developed to help categorize the objectives of a learning system, as well as help teachers assess students’ performance in any course. Bloom’s taxonomy was originally published in the 1950’s and categorized learning into three domains of behavior: affective, psychomotor, and cognitive. The affective domain focuses on the way individuals deal with things emotionally, such as feelings and attitudes. The psychomotor domain focuses on physical movement, coordination, and motor skills. The cognitive domain is pivotal to the education field because of its application to identify preferred behavior patterns following instruction, both in simple and complex ways (Halawi, McCarthy, & Pires, 2009).

According to Bloom’s taxonomy, learning tasks can be categorized into the stages: remembering, understanding, applying, analyzing, evaluation, and creating (Churches, 2009). Educators and instructional designers have used these levels of Bloom’s taxonomy to create and align class objectives, lesson, and assessments in order to achieve the same cognitive levels seen in the traditional classroom (Halawi et al., 2009). Therefore, it is important for teachers to consider Bloom’s taxonomy when choosing online learning tools that support RPT in order to capitalize on cognitive learning stages, while also supporting the unique learning paradigm of OLE.

**Research-based Pedagogical Techniques**

 While the world of online education is exciting for its potential to reach students individually, the tools available for teachers to use is rapidly changing. As a result, it is important to consider what techniques have already been implemented with pedagogical success through particular online learning tools. This will save teachers’ time and frustration, as they cannot possibly implement every technique.

 OLE strengths lie in student empowerment, flexibility, accommodation, customization, collaboration, and creation. Students are empowered through OLE in a number of ways. They are free to access materials whenever and wherever they want, using a system they are comfortable with. This flexibility allows students to learn in a way in which they are successful. They are empowered to make choices on how to explore content, which is accommodating to different learning styles. For instance, a learner can watch a video lecture if they prefer visual learning, listen to the same lecture while they are driving or exercising if they prefer audio, or even read the transcript if text learning is their preference. Often times, students can customize portions of the course management system (CMS) used by their school for their own personal preference, such as including a picture of themselves; changing the background color, font or font size for reading clarity; and even setting notifications. Lessons and projects can also offer customization to the student's interest, which empowers students to own their learning experience and ensures relevancy. OLE also fosters collaboration in which students interact with each other, the teacher, various content, and even the outside world. This interaction expands the sources of knowledge and allows students to be involved in the world, as well as their own studies. In OLE, students create their own learning experience; it not only puts the student at the center of the learning experience, but also makes them responsible for their own learning. This challenges the previous learning paradigms.

The traditional learning theory of ‘sage on the stage’, also known as passive transmittal learning, emphasizes the teacher as the center of the learning process. It places the responsibility of learning on the transfer of knowledge from the expert (teacher) to the novice (student). Education rooted in the teacher-center approach often uses direct instruction techniques, such as lecture while the students sit and take notes. Given the fundamental design of OLE, namely that the teacher and student are not physically present, there must be a change from this learning paradigm so that each student can be successful in this learning environment.

A student-center approach to learning is often referred to as the teacher being ‘the guide on the side’. While this can be straightforward to imagine in the face-to-face classroom, it is harder to conceptualize in the virtual setting. Teachers in OLE cannot float around the classroom, observing student work, watching student processes, standing ready to offer guidance when errors or misconceptions arise. While this approach places more responsibility on the student, the teacher still sets up the active learning activities and shares in the responsibility. Therefore, even this approach needs to be modified for successful learning to occur in the virtual setting.

The pedagogical techniques employed in OLE should optimize student engagement and success (Casey & Evans, 2012; Hazari et al., 2009). They should foster interaction between student and content, other students, teachers, and outside experts (Alghamdi, 2013; Edwards et al., 2012; Hewege & Perera, 2013). They should facilitate learning through providing intellectual stimulation, salient questions, ethical options, and resources for further inquiry (Freidhoff, 2008; Joshi & Babacan, 2012). They should offer ways to sort out, recognize, and enhance students’ unique qualities, interests, and skills (Casey & Evans, 2011; Doering et al., 2009; Hadjerrouit, 2011). They should allow for critical and reflective thinking, real-world application of concepts and skills, as well as encourage additional dialogue and seeking of assistance (Ang et al., 2008; Im & Lee, 2004; Lee & Osman, 2012). As a result, I would argue that a constructivist, social and collaborative learning paradigm be employed with secondary students in online education by teachers applying RPT through effective incorporation of various online learning tools.

**Constructivist learning.**

 Constructivism, accredited to Jean Piaget, is an inquiry-based, discovery learning theory based on the premise that human beings construct our own perspective of the world, through individual experiences and created schemas. It is an approach that gives the student an active role in the construction of knowledge (LeFrançois, 2012). OLE has many constructivist aspects as learners must be responsible for their own learning and must construct their own knowledge through interactions and experiences. Skagen et al. (2008) emphasizes, “it is of great importance for distance education students to relate their studies to their previous experience, and to be able to apply their knowledge to their work context” (p. 91). This interaction and application is a cornerstone of OLE as students are empowered to own and construct their own learning.

**Social learning.**

 Social learning theory, by Albert Bandura, focuses on the importance of social cultural context in understanding what occurs in the world through social interaction and knowledge construction. Bandura (1971) explained psychological functioning in terms of reciprocal interaction between behavior and its controlling conditions. However, learning was not limited to direct action and consequence. Essentially, all learning that can occur through direct experience can also occur through observation of others behavior and consequence in the social learning theory. Similarly, emotional learning, behavioral inhibitions, and future directions can also be influenced through observation alone (Bandura, 1971). Therefore, watching, observing, and modeling are the bases of social learning theory (LeFrançois, 2012) and OLE can provide many opportunities for learners to engage in these. However, the sources for observation, modeling, and imitation in OLE expand beyond those individuals with whom a learner has direct contact to all educational sources, both people and materials available online.

Social learning mirrors constructivism as it views learning as a social process, “meaningful learning occurs when individuals are engaged in social activities” (Ang et al., 2008, p. 540). For example, in virtual worlds, players understand the rules of the game through their interaction with other players. Social learning focuses on human interaction in group activities and synergistic efforts using problem-based learning (Hazari et al., 2009). This cornerstone of OLE is displayed in the learners’ interaction not only with peers and teachers, but also content and materials available throughout the world.

 **Collaborative learning.**

 Collaborative learning is an educational method where two or more students work together to learn something. It is heavily rooted in Lev Vygotsky’s zone of proximal development in which other people help learners do more than they would be able to if left alone (LeFrançois, 2012). By grouping students together and promoting interaction, students can support and learn from each other, thereby accomplishing more difficult tasks. Critical thinking skills are enhanced as students learn to think about, understand, and challenge other’s views. Good listening and feedback skills are also developed through collaborative learning. This final cornerstone of OLE allows a wider audience to both learn from and contribute to.

**Online Learning Tools**

 Based on the theoretical framework above, along with the review of literature, the following online learning tools have been chosen because of their previously proven use in supporting research-based pedagogical techniques in constructivist, social, and collaborative learning. This study looked at how these online learning tools are used by online secondary teachers to implement RPT in order to evaluate the impact on student participation, academic achievement, and satisfaction in OLE with secondary students.

**Wikis.**

A wiki is a website that allows users to collaboratively add new information into or edit existing information. The key features of a wiki are: collaborative productions, process logs, and pages under construction. By doing so, they function as a social learning environment, that, through student contribution and collaboration, promotes learning which is more effective than the sum of individual work (Hadjerrouit, 2012). There are several wiki tools available from different vendors, such as Curriki, MediaWiki, and PBWorks. Wikis can employ RPT in these Bloom’s taxonomy stages: understanding with simple page construction; applying through editing; analyzing when reporting or monitoring; and creating by designing, planning, or making a wiki page (Churches, 2009).

Wikis not only help build a sense of community, but also support collaborative learning through sharing, group work, and peer interactions. Hewege and Perera’s (2013) study analyzed 30 student-generated wikis, by Net-Gen students in an international marketing course, to uncover the pedagogical implications of wiki integration. The results showed: productive and enriched collaborative learning among the students, accommodation of different opinions in one space, adequate space to express one’s opinions, opportunities to weigh pros and cons of an argument, develop own opinions and shape independent thinking, critical assessment of relevant issues, spontaneous student leaders, advanced level of learning and thinking, heightened enthusiasm to participate, enhanced individual assignments, and the construction of new knowledge through reflective thinking and writing.

Wikis also naturally accommodate different approaches to learning while putting the student at the center of learning. This empowers students while enhancing social interaction and communication, all of which may result in deeper knowledge retention. Hazari et al. (2009) performed an exploratory study to investigate the value and factors of wikis with learner outcomes in a web-based environment. They used the specific tool, Wikispaces, for student assignments and then presented an online survey to gain feedback from 70 respondents, ages 18 and older. The open-ended comments included:

* most innovative way of doing group assignments,
* provides opportunities for leadership,
* good collaborative features,
* individual’s thought process can be seen in discussion area, and
* introduces variety and exposes students to different instructional strategy.

Wikis can also enhance information retention and learning as it promotes active learning techniques, such as cooperative and collaborative learning. Furthermore, a sense of authorship, cooperation, increased confidence, and positive class dynamics have been found to be significant benefits of wikis (Hewege & Perera, 2013). Hadjerrouit (2012) pointed out that wikis “foster collaborative learning and writing, knowledge sharing, group discussion, and active participation amount students” (p. 46). Wikis serve as a platform for students to share information, work together, and construct new knowledge in line with the constructivist, social, and collaborative learning paradigm.

**Blogs.**

 The term ‘blog’ is short for ‘web log’ and, by its simplest definition, is an online diary presented in reverse chronological order with the ability for a reader to comment. Joshi and Babacan (2012) noted, “it gives both teachers and students new spaces to intervene in the mutually enriching process of knowledge building” (p. 23). There are a number of free public hosting sites for blogs, such as www.Blogger.com and www.EduBlogs.com, which have turned blogging into an alternative for publishing, journalism, and community building.

 A key feature of blogs is that they incorporate RSS (Really Simple Syndication) feeds, which allows readers to subscribe to blogs using an aggregator, such as www.bloglines.com. Essentially, a person can monitor changes on multiple blogs by accessing a single site, a task similar to checking one’s email. Blogs also allow for tagging or labeling each post with one or multiple keywords. This makes it possible for a student to utilize one blog for multiple audiences, but still identify posts that pertain to a particular class. Both of these abilities are crucial when considering using blogs for teaching applications. By setting up an aggregator properly, a teacher can login to one website and check for student posts tagged with the designated class identifier to see if the students have completed the assignment.

 Blogs can be used in a number of Bloom’s taxonomy stages. Blog journaling can show remembering when used to reproduce or list specific information. Journaling through a blog can also show understanding when summarizing, explaining, or inferring. Blog commenting can show evaluating by offering critiques, judgment, or testing of others’ writing. Blogging and video blogging can show creating through designing, constructing, producing, and making (Churches, 2009).

Blogs can be an effective RPT to enhance learning. For one, because blogs are extremely popular, the secondary and post-secondary student population will undoubtedly be familiar with them. Freidhoff (2008) reported that 87% of 12 to 17-year-olds are online and within this category, 19% maintain their own blogs and 38% read them. Joshi and Babacan (2012) pointed to multiple studies that showed: a marked preference for blogging; a majority-favored use in courses; high levels of participation; and increased individual creativity. Familiarity and ease of use will help minimize student and teacher frustration when utilizing this online learning tool for RPT in OLE.

Blogs also allow students to interact with other interested members of the web environment, removing them from being passive recipients of information. They can empower students by giving them a chance to express themselves, their views, and their work to a larger audience. Joshi and Babacan’s (2012) research showed a distinctive shift towards reflection; a deeper and enabling structure for students; an increase in writing and commenting capability; an increase in quality of interaction; and an emergence of group culture through the use of blogs.

Blogs encourage learner ownership by allowing individuals to control their blogs with everything from font choice to the way that content is shared. Freidhoff’s (2008) study involving pre-service teachers found: increased student actions because of blogs’ affordances for individuality, sustainability, and writing for larger audiences; the use of blogs led some students to sustain their writing beyond the boundaries of the course; and advantages of flexibility for using one blog for multiple communities.

Furthermore, blogs allow student writing and reflections to be contained in one place: “this cohesive repository of one’s writings may help students monitor their own thoughts over time and make connections across topics, while at the same time increasing their feelings of ownership” (Freidhoff, 2008, p. 119). Blogs are personally meaningful and naturally foster sharing and collaboration, which supports RPT implementation in the constructivist, social, and collaborative paradigm of OLE.

**Discussion boards.**

Discussion boards are similar to blogs in their reflection and interaction aspects. Online discussion boards, also referred to as forums, are places for students to write and interact within a CMS, which constrains them to a specific school and course. They are set up by the teacher or course designer as a part of an online course, accessed using a secure login, and are visible only to other students in the same course. They can be used for a number of Bloom’s taxonomy stages: remembering is shown when discussion boards are used to reproduce specific content information or recall facts; understanding when commenting that compares or further explains; analyzing when destructing, attributing, or integrating; and evaluating when checking, monitoring, or critiquing (Churches, 2009).

There are many pedagogical advantages of discussion boards. Freidhoff (2008) noted the advantages on CMS discussion boards include students already have access to them, students can use them to be successful on course assignments, and they expand the audience to include others in the course. Alghamdi (2013) argued that the use of discussion boards could be used to help students share and debate, while also transforming educational practices for the better. Discussion boards allow students to discuss concepts, express their ideas, engage with other students, and reflect on topics.

Alghamdi (2013) studied 155 female second-year university students to see how the use of discussion boards related to changes in test scores in which the experimental group used them and the control group did not. The results showed increased knowledge of course content and raised post-test scores. Student responses showed positive attitudes towards discussion board use; they found it useful, engaging, increased motivation, raised self-esteem, and less feelings of embarrassment, which allowed more discussion.

Discussion boards can promote student participation in group settings and aide in community building (Hazari et al., 2009.) By breaking down barriers, shy students or those not used to participating in face-to-face classrooms join in dialogue (Alghamdi, 2013). Im and Lee (2004) noted that online discussions promote active participation and social interaction, enhance learning, as well as motivate membership in the online learning community.

To illustrate this, Im and Lee (2004) studied 40 pre-service teachers from a cyber university to find out how asynchronous and synchronous discussion tools were used. The results showed that synchronous discussion tools, such as chat rooms, were used heavily for social bond formation where the first stage of a learning community is developed. The asynchronous discussion board was used more for information sharing where participants felt comfortable exchanging knowledge, and the advanced stage of learning where participants apply advanced metacognitive skills such as awareness, reflection, and evaluation.

Furthermore, Im and Lee (2004) explained that content directly related to the topic, subject matter, and academic learning were greater in the asynchronous discussion than in the synchronous discussion, implying that a “synchronous discussion is better used to create a social bond for the group” (p. 159) and “actual learning and knowledge achievement benefit more from asynchronous discussions” (p. 166). As a result, discussion boards can be an effective online learning tool to apply a variety of RPT with and support constructivist, social, and collaborative learning in OLE.

**Social network sites.**

Social network sites, also referred to as social media sites, such as Facebook, Ning, and SuperClubsPLUS, attract young people today. Because of the familiarity with the target population, ease of use, and ease of access, social network sites could be incorporated seamlessly into OLE. By doing so, they would extend learning to a dynamic, changing, and shared experience beyond the boundaries of the classroom. They would actively engage students, as many already monitor their own online presence for new activity or comments often. Casey and Evans (2011) noted that social network sites enable students to interact with one another, build a sense of community, develop content, as well as require students to be active in their learning through participating, thinking, and contributing. Social network sites can be used for learning in Bloom’s stages of: remembering when locating, ‘liking’, or recognizing; understanding when subscribing or tagging; and evaluating when justifying a decision, collaborating or networking via the site (Churches, 2009).

Ng’ambi (2013) drew upon data collected as a part of a larger study in order to evaluate transformative learning and teaching practices by looking at responses from 262 educators across 22 public higher education institutions in South Africa where 68% used social network sites for sharing resources. The results showed: students learned from one another; students engaged with experts from the professional community; student thinking and learning was extended beyond class time; communication between students and professionals was facilitated; and a learning community was built.

Casey and Evans (2011) studied 900 public high school students between the age of 13 and 16 with the use of an online social network site Ning as a learning environment for one semester. The study showed the use of a social network site resulted in:

* great range of opportunities for students to form own groups;
* students to be explorers, designers, and publishers;
* greater support of peers, self-reflection, and both peer- and self-assessment;
* students draw upon relevant, integrated knowledge;
* use of skills that many had honed outside of the classroom;
* flexibility to read and write comments, ask questions, and seek clarification;
* student enjoyment of creating new profiles, avatars, and friend requests;
* teaching and learning occurring informally and formally;
* shared examples of student work aided others;
* increased creativity and use of multimedia;
* more opportunities to make decisions;
* increased student control of learning;
* generating new knowledge;
* improved critiquing abilities;
* increased interaction with peers at a personal level;
* teaching to peers or younger students;
* increased connectedness; and
* added depth and excitement to the learning process.

An advantage of social networks sites as RPT is that teachers can easily incorporate and share multimedia through them, thereby providing a rich content experience that accommodates learning styles and preferences. Social network sites also provide a collaborative learning environment that is not bound by time constrictions, allow for informal learning opportunities to increase, and support active knowledge construction through interaction with experts as well as peers. As Casey and Evans pointed out, “[students’] motivations, interests, attention, and involvement may all be strongly affected by their relationships with their peers” (p. 3). By incorporating social network sites, teachers can not only capitalize on skills that students already use outside of the school atmosphere, but also on their interests and habits. All of these characteristics support the use of social network sites as an online learning tool to implement RPT in the constructivist, social, and collaborative paradigm of OLE.

**Interactive tutorials/modules.**

Interactive tutorials, modules, and software are content specific tools used to enhance student understanding of a specific skill or subject matter. They can help students visualize complex or abstract topics, such as physics. Tillander (2011) noted that interactive tutorials allow students to become active participants in meaningful activities. These types of programs utilize such things as animation, simulation, video, and audio, to foster student interaction with concepts and processes at a level not available in the ordinary classroom. For example, an interactive chemistry module could allow visualization of chemical processes at macroscopic, microscopic, and symbolic levels, or an experiment could allow instant results between input and output. Assessment can take the shape of quizzes, multiple choice questions, or pop-up feedback in these modules, which serve as a formative way for students to self-check their knowledge.

Interactive tutorials and modules facilitate learning by: allowing students to work at their own pace, engaging with different audio and visual techniques, allowing for personalization, and motivating through problem solving and interaction. Lee and Osman (2012) studied the use of a specific interactive module, EC Lab, with 35 students and 7 experts. The results showed statistically significant increase in achievement tests, as well as in the level of motivation, both intrinsic and extrinsic, resulting in students who were “found to be more motivated and interested, and achieved higher performance when learning with tutorials” (p. 60).

Tutorials and modules also express content in a meaningful way and deliver it effectively to students. Skagen et al. (2008) noted that modules and tutorials utilize a reciprocal process of doing and reflecting, which requires engagement and interaction of the student throughout the learning process. Doering, Veletsianos, Scharber, and Miller (2009) studied the use of a specific program, GeoThentic, with 20 in-service teachers and found: highly positive impact on the teachers’ knowledge development and confidence in teaching geography with GeoThentic; content and lesson-specific technology knowledge of GeoThentic as an incredible opportunity to realize the potential of technology within the classroom; all teachers showed and stated that their geography knowledge increased; as well as teachers’ technology knowledge increased.

Tutorials and modules can be utilized in the Bloom’s taxonomy stage of applying when students are implementing, executing, or operating simulations (Churches, 2009). Interactive tutorials and modules place the student at the center of the learning experience, provide interaction with content materials, and allow for self-paced skill practice with formative feedback, thereby supporting RPT in OLE learning paradigm.

**Virtual worlds.**

Virtual worlds can be known as game-based world, massively multiplayer online world (MMOW), or computer-based simulated environment. They are interactive, three-dimensional, online environments where individuals, represented as avatars, engage in various activities. It is a digital world created by its residents, with the ability to participate in a variety of activities, such as building houses or growing gardens. There are many 3D virtual worlds available, such as Second Life, Whyville, and Twinity. Sarachan (2011) pointed to the popularity of online worlds and gaming to argue that virtual worlds will have a greater role in the future and preparing students for that eventuality is valuable. Virtual worlds can be used to put learners at the center of the learning experience where students can carry out tasks that may be difficult to accomplish in the real world because of time, cost, or location.

Twining (2009) used Second Life to explore re-conceptualizing educational pedagogy with 13-17 year olds and found that virtual worlds were ideal for: providing people with lived experiences that were radically different; allowing one to do things that would be impossible in physical world, both literally and pragmatically; as well as encouraging testing of boundaries within the virtual world. It was also discovered that learning occurred through four kinds of activities: learning about (through discussions), learning by doing (creating or playing), learning by playing a role (participating in an event), and learning by becoming (take on a role). Virtual worlds provided a vehicle for explicit and critical reflection on experiences and understandings, as well as engagement in identity construction through the use of avatars (virtual characters controlled by the user).

Schiller (2009) used Second Life with 32 higher education business students. The results showed students were: able to apply what they learned in class into the virtual environment through their exploration and interaction; motivated to learn; engaged with the experiences which aided their learning; pleased and felt Second Life was fun and effective in delivering the learner-centered experience.

Virtual worlds allow users to access and use learning materials, feel involved, and interact with more comfort and ease. Virtual worlds also empower the user with choice in such things as: designing their avatar, where to go, what to do, and who to engage with. In contrast to the other online learning tools, the activities that a student engages in within the virtual world would determine which of Bloom’s taxonomy stage of learning is occurring. For instance, in the virtual world a student may take part in an advanced searching activity, which would support the understanding stage or playing a game through a virtual world would show the applying stage (Churches, 2009). By empowering users with access, interaction, and choice, virtual worlds can be used to implement RPT that supports constructivist, social, and collaborative learning.

**Barriers to Implementation**

There are many online learning tools that have been found, through the literature, to allow effective implementation of RPT for constructivist, social, and collaborative learning. Unfortunately, some studies also showed that these tools are not always being implemented in OLE. There is limited research explaining why teachers are not using these online learning tools, but points to such issues such as:

* online learning tool unknown,
* lack of technology knowledge/training to use the tool itself,
* lack of guidance in how the tool should be used for educational purposes,
* lack of support by administration to use a new learning tool;
* lack of course time to actually implement the tool,
* did not see the potential of tool,
* not enough time to learn tool, or
* perceived added workload by using the tool.

**Gaps in Research**

The literature showed that there are many online learning tools in which RPT can be successfully applied through in OLE to support constructivist, social, and collaborative learning. Research has found strong links between courses that effectively use online learning tools and student outcomes (Alghamdi, 2013; Ang et al., 2008; Casey & Evans, 2011; Freidhoff, 2008; Hewege & Perera, 2013; Im & Lee, 2004; Joshi & Babacan, 2012; Lee & Osman, 2012; McNeill & Fry, 2012; Sammel et al., 2013; Schiller, 2009; Skagen et al., 2008; Twining, 2009). However, while researchers have studied the effectiveness of various online learning tools in different categories such as motivation (Lee & Osman, 2012; McNeill & Fry, 2012; Schiller, 2009), there is minimal research that examines multiple online learning tools in order to help teachers prioritize the implementation of them.

Furthermore, most of these studies focused on post-secondary students (Alghamdi, 2013; Doering et al., 2009; Edwards et al., 2012; Hadjerrouit, 2012; Hazari et al., 2009; Im & Lee, 2004; McNeill and Fry, 2012; Sammel et al., 2013; Schiller, 2009), thereby posing the question if the same online learning tools would be beneficial for secondary students, an increasing population utilizing OLE.

While it is clear that using these online learning tools to implement RPT offers benefits for students, it is still unclear which tools are most effective for impacting student participation, academic achievement, and satisfaction in secondary students. By examining what other online secondary teachers have implemented, teachers can get a better understanding of how online learning tools can be used effectively to support RPT implementation. By comparing tool use and their impact on student participation, academic achievement, and satisfaction, teachers can prioritize tool choice based on their desired outcome. With this understanding, teachers can make informed decisions about which online learning tools to implement RPT through in their courses in order to positively impact student participation, academic achievement, and satisfaction.

**Research Questions**

The questions guiding this study are: 1) Which online learning tools are teachers implementing RPT to support constructivist, social, and collaborative learning in OLE? 2) How does RPT and tool use affect the specific learner outcomes of: student participation, academic achievement, and satisfaction?

**Significance of this Study**

This study offers online secondary teachers a practical approach for choosing online learning tools to apply RPT into their courses in order to increase student participation, academic achievement, and satisfaction. Since there is a multitude of tools that teachers could use, knowing which tools have been implemented successfully will help avoid teacher frustration, as Sarachan (2011) pointed out that selecting such things as software, assessment options, and content choices, are better made when one is exposed to others’ experiences. Therefore, understanding what other teachers have tried and found successful will benefit future online teachers. This study also explored barriers that other participating teachers identified hinder their use of some of these online learning tools to implement RPT into online secondary courses and offers suggestions for overcoming them. Teachers may find value in the opinions and experiences of other teachers, and use the conclusions of this research study to guide their use of online learning tools and research-based pedagogical techniques.

**Chapter 3: Method**

**Research Design**

This study is a descriptive quantitative survey research study (Leedy & Ormrod, 2013) that used a survey to gain information about teachers’ opinions on the effectiveness of online learning tools for RPT implementation. The answers to the survey are quantified and analyzed to help draw conclusions about the population.

**Population and Sample Selection**

This study investigated the views of online secondary teachers at 14 online learning providers in one Midwest state of the United States. Together these 14 schools employ approximately 189 secondary online teaching staff. The survey was sent to all secondary online teachers at the 14 schools. The survey was used to collect demographic information about the participants in the study which may impact their usage of online learning tools, how many years they have been teaching, both online and altogether, level of education, technology comfort level, and experience with online learning tools.

**Instrumentation**

This study used an online survey to gain feedback from online secondary teachers regarding their views on the effectiveness of selected online learning tools for RPT implementation and the tools’ impact on student participation, academic achievement, and satisfaction in OLE. The researcher developed and administered the survey instrument used in this study through SurveyMonkey™. The tools inquired about on the survey are online learning tools that have been found effective through prior research studies (discussed earlier in the review of literature). The survey used a Likert interval scale where participants rated each indicator item on a scale ranging from “Strongly Disagree” to “Strongly Agree”, with “Neither Disagree or Agree” as the midpoint. Indicator items were presented randomly to respondents. Participants also indicated their usage of each given tool by indicating whether they use the online learning tool daily, weekly, monthly, 2-3 times a course, once a course, or never.

If they had never used the tool, participants were able to select if any of the given barriers (Sample Survey Instrument can be found in Appendix A) hindered their implementation of RPT through the online learning tool. Participants had the opportunity to indicate any and all barriers for each online learning tool, as well as give their own answer if desired.

Participants also used the Likert interval scale ranging from “Strongly Disagree” to “Strongly Agree”, with “Neither Disagree or Agree” as the midpoint to give their personal response to using the online learning tool for RPT implementation (See Appendix A). Teachers were also asked to share ways in which they utilize the online learning tool in their online courses if they so choose.

 Before being administered, the survey was reviewed by a panel of experts in the field to help establish face and content validity. Two doctorate experts in the field of education reviewed all questions for content validity and category relation. A field test was conducted with four teachers to identify strategies for strengthening the instrument. A measure of the internal consistency reliability was calculated through Microsoft Excel**™** to establish the reliability of the instrument*.* Cronbach’s alpha reliability coefficients for the effectiveness of student outcome questions range from .82-.96 for all tools and the barrier scale was .94. A sample of the survey instrument can be found in Appendix A. Before conducting this research, the researcher secured Institutional Review Board approval from the host university.

**Data Collection**

The survey was distributed to participants through email (Contact email can be seen in Appendix B). Data was collected in November 2014. To gain official approval, the researcher first contacted the directors of all approved online learning providers listed on one Midwest State’s Department of Education website, totaling 31 schools, to explain the study and ask for permission to contact the online secondary teachers at the school through email. A total of four request emails were sent to the directors, spaced up to three weeks apart. 14 directors agreed to allow their teachers to participate, four declined, four did not reply, one program closed due to not being financially sound, one was only a course management source, two had invalid contact information, and five outsourced their teaching staff. The researcher also requested a list of teacher email addresses. The 14 schools provided 189 secondary online teachers email addresses. The researcher sent an initial email to the participants introducing herself, explaining the study, and asking them to voluntarily participate in the study by answering questions. The email also included a link to the online survey and consent information. Three follow-up emails, spaced up to 10 days apart, were sent to participants who did not respond. Submissions were coded by the researcher and all identifiers were removed.

**Data Analysis**

The researcher used Microsoft Excel™ and its add-on data analysis tools to calculate the descriptive statistics of demographic information based upon the scale of measurement (e.g., nominal, ordinal, interval, and ratio). The researcher calculated and reported the central tendencies of the demographics. Means, standard deviations (SD), and standard errors (SE) were used to describe and compare the data gathered from the online survey using the interval rating scale. Frequency and percentages were calculated to determine the most frequently used strategies, as well as barriers for tool implementation.

**Chapter 4: Results**

A total of 102 secondary online teachers participated in this study. Seventy were female and 32 were male. The majority of participants had additional education beyond that of a bachelor’s degree (86%). Teaching experience varied with approximately one third reporting 5-10 years of experience teaching online (37%), and a similar percentage reporting more than 16 years teaching altogether (35%) with the rest in between. See Table 1 below.

Table 1

*Participant Demographics*

|  |  |
| --- | --- |
| Characteristics | *n* (%) |
| Sex | Male | 32 (31%) |
|  | Female | 70 (69%) |
| Age | 18-25 | 5 (5%) |
|  | 26-45 | 62 (61%) |
|  | Over 45 | 35 (34%) |
| Education Level | Bachelor’s Degree | 14 (14%) |
|  | Bachelor’s degree plus additional credits master’s degree | 27 (26%) |
|  | Master’s degree | 27 (26%) |
|  | Master’s degree plus additional credit | 34 (34%) |
|  | Doctorate degree | 0 (0%) |
| Years of experience teaching online | Less than 1 year | 17 (17%) |
|  | 1-2 years | 12 (12%) |
|  | 3-5 years | 29 (28%) |
|  | 5-10 years | 38 (37%) |
|  | 11-15 years | 5 (5%) |
|  | More than 16 years | 1 (1%) |
| Years of teaching experience altogether | Less than 1 year | 3 (3%) |
|  | 1-2 years | 4 (4%) |
|  | 3-5 years | 12 (12%) |
|  | 5-10 years | 24 (23%) |
|  | 11-15 years | 23 (23%) |
|  | More than 16 years | 36 (35%) |
| Experience with online tools (i.e. blogs or wikis) | Beginner | 15 (15%) |
|  | More than a beginner, but less than intermediate | 24 (23.5%) |
|  | Intermediate | 24 (23.5%) |
|  | More than intermediate, but less than expert | 33 (32%) |
|  | Expert | 6 (6%) |
| Technology comfort level | Beginner | 0 (0%) |
|  | More than a beginner, but less than intermediate | 4 (4%) |
|  | Intermediate | 24 (23%) |
|  | More than intermediate, but less than expert | 63 (62%) |
|  | Expert | 11 (11%) |
|  | Total | *n =* 102 |

A noteworthy difference exists between the way teachers reported their comfort level with technology and their experience with online learning tools. While only 38% reported their experience with online learning tools to be above intermediate, the amount almost doubled when reporting their comfort with technology overall (73%). Table 2 below shows the reported percentages.

Table 2

*Technology and Online Learning Tool Comfort Levels*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Comfort Level |  | Level1 | Level2 | Level3 | Level4 | Level5 | Total*N* | Average Rating |
| Online Learning Tool | *n**%* | 15 | 24 | 24 | 33 | 6 | 102 | 2.91 |
| 15% | 23.5% | 23.5% | **32%** | **6%** |  |  |
| Overall Technology | *n**%* | 0 | 4 | 24 | 63 | 11 | 102 | 3.79 |
| 0% | 4% | 23.5% | **61.5%** | **11%** |  |  |

 *Note.* Beginner = 1; More than a beginner, but less than intermediate = 2; Intermediate = 3; More than intermediate, but less than an expert = 4; Expert = 5

**Usage of Research-based Pedagogical Techniques**

 This study sought to understand how online secondary teachers utilized online learning tools to implement RPT and the perceived effect on student participation, academic achievement, and satisfaction. Table 3 below shows how many participants used each selected online learning tool and how often. Interactive tutorials/modules had the most reported daily use (27%), while discussion boards were reported most frequently used on a weekly basis (44%). Blogs were utilized much less, but still had some presence overall (32%). The vast majority of participants had never tried virtual worlds (93%), social network sites (91.5%), or wikis (86%).

Table 3

*Frequency of Usage of Online Learning Tools*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Online Learning Tools | Daily | Weekly | Monthly | 2-3x a course | Once a course | Never |
| Blogs *n* = 102 | 1% | 10.5% | 3% | 7% | 10.5% | 68% |
| Discussion Boards *n* = 98 | 9% | **44%** | 12% | 14.5% | 5% | 15.5% |
| Social Network Sites *n* = 94 | 1% | 3% | 1% | 2.5% | 1% | **91.5%** |
| Wikis *n* = 91 | 1% | 1% | 2% | 1% | 9% | **86%** |
| Interactive Tutorials/Modules *n* = 88 | **27%** | 20.5% | 7% | 12.50% | 8% | 25% |
| Virtual Worlds *n* = 83 | 0% | 4% | 0% | 2% | 1% | **93%** |

**Effectiveness of Research-based Pedagogical Techniques**

This study focused on the online learning tools that had the most usage from participants. As such, the three tools with the most teacher use: blogs (32%), discussion boards (84.5%), and interactive tutorials/modules (75%), were evaluated for their impact on student participation, academic achievement, and satisfaction. Table 4 below shows the participants perceived effectiveness of these three online learning tools and each student outcome question.

Table 4

*Effectiveness of Online Learning Tools and Outcome Questions*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Blogs*n =* 33 | Discussion Boards*n =* 83 | Interactive Tutorials/ Modules*n =* 66 |
| Outcome Category | Questions  | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Participation | Use of this tool helped students to interact more with materials/content | 3.39 | 0.67 | 3.62 | 1.00 | 4.13 | 0.59 |
| Use of this tool encouraged collaborative learning | 3.35 | 0.75 | 3.61 | 0.95 | 2.61 | 1.04 |
| Use of this tool resulted in students completing assignments on time  | 2.84 | 0.78 | 2.82 | 0.84 | 3.44 | 0.74 |
| Use of this tool resulted in students interacting and connecting with other students | 3.45 | 0.77 | 3.81 | 0.96 | 2.51 | 0.96 |
| Use of this tool increased student engagement  | 3.42 | 0.76 | 3.66 | 0.97 | 3.85 | 0.65 |
| Academic Achievement | Use of this tool increased information sharing among students | 3.29 | 0.78 | 3.75 | 0.91 | **2.69** | 0.99 |
| Use of this tool aided in achieving course objectives | 3.52 | 0.68 | 3.76 | 0.95 | **4.18** | 0.59 |
| Learning was enhanced by use of this tool | 3.48 | 0.68 | 3.70 | 0.98 | **4.10** | 0.60 |
| Use of the tool resulted in improvement in students’ knowledge of the content | 3.48 | 0.72 | 3.51 | 0.99 | **4.15** | 0.68 |
| Students contributed to each other’s learning through this tool | 3.16 | 0.86 | 3.56 | 0.94 | **2.46** | 1.01 |
| Satisfaction | Students were frustrated with use of this tool (Reverse calculated) | 3.06 | 0.89 | 3.49 | 0.83 | 3.43 | 0.83 |
| Students were motivated to use tool | 3.10 | 0.70 | 3.28 | 1.00 | 3.72 | 0.69 |
| Students were excited to use this tool | 3.03 | 0.75 | 2.85 | 0.80 | 3.57 | 0.74 |
| Students found the tool to be engaging and useful | 3.48 | 0.63 | 3.35 | 0.88 | 3.98 | 0.70 |
| Use of this tool was a positive experience for students | 3.58 | 0.67 | 3.59 | 0.81 | **4.02** | 0.59 |

*Note.* 1 = Strongly Disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly Agree

 Interactive tutorials/modules received high marks as RPT for academic achievement in the questions that reflected individual work: use of this tool aided in course objectives (*M* = 4.18, *SD* = .59); learning was enhanced by use of this tool (*M* = 4.10, *SD* = .60); and use of this tool resulted in improvement in students’ knowledge of the content (*M* = 4.15, *SD* =.68). However, it received the low ratings as RPT for those questions that reflected academic achievement through sharing or working together: use of this tool increased information sharing among students (*M* = 2.69, *SD* = .99); and students contributed to each other’s learning through this tool (*M* = 2.46, *SD* = 1.01). It also received the high marks in student satisfaction, particularly in reference to it being a positive experience for the students (*M* = 4.02, *SD* = .59).

As noted by the outcome category in Table 4 on the previous page, this study designed five questions in each category in order to gain an accurate opinion from the participants regarding the effectiveness of the online learning tools for RPT implementation. There was one question designed in a counterbalance approach in order to help address participants’ general tendency to agree or disagree when presented with a great many statements (Leedy & Ormrod, 2013). Table 5 below shows the participants’ responses for the categories regardless of demographic information.

Table 5

*Effectiveness and Outcome Categories*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Blogs*n* = 33 | Discussion Boards*n* = 83 | Interactive Tutorials/Modules*n* = 66 | ANOVA |
| Outcome Category | *M* | *SE* | *M* | *SE* | *M* | *SE* | *p* |
| Participation | 3.29 | .22 | 3.50 | .22 | 3.31 | .22 | .76 |
| Academic Achievement | 3.39 | .23 | 3.65 | .23 | 3.51 | .23 | .72 |
| Satisfaction | 3.25 | .12 | 3.31 | .12 | 3.74 | .12 | .**03** |

*Note.* 1 = Strongly Disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly Agree

Discussion boards reported a generally positive score for RPT impact on both student participation (*M* = 3.50, *SE* = .39) and academic achievement (*M* = 3.65, *SE* = .11). Interactive tutorials/modules was rated positively for successful RPT influence on student satisfaction (*M* = 3.74, *SE* = .26). Whereas discussion boards and blogs were rated somewhat positively: (*M* = 3.31, *SE* = .73) and (*M* = 3.25, *SE* = .86) respectively.

A significant between-group difference was identified on academic achievement by the tools so a post-hoc t-test was conducted. Interactive tutorials/modules were reported to have higher effectiveness on satisfaction than blogs and discussion boards (see Table 6 below).

Table 6

*Post-hoc t-Test Satisfaction Category*

|  |  |  |
| --- | --- | --- |
|  | Discussion Boards | Interactive Tutorials/Modules |
| Mean | 3.31 | 3.74 |
| Variance | 0.08 | 0.07 |
| df | 8 |  |
| t Stat | -2.499 |  |
| P(T<=t) two-tail | 0.037 |  |
|  | Blogs | Interactive Tutorials/Modules |
| Mean | 3.25 | 3.74 |
| Variance | 0.07 | 0.07 |
| df | 8 |  |
| t Stat | -3.022 |  |
| P(T<=t) two-tail | 0.016 |  |

In order to examine any affect participants’ years of online teaching experience had on student participation, academic achievement, and satisfaction, each participant’s response to all five questions within one category were averaged, and then placed into a two-factor ANOVA table in their respective demographic group. However, there was typically no statistical difference among the groups, shown in Table 7 on the following page.

Table 7

*Online Teaching Experience and Outcome Categories*

|  |  |  |  |
| --- | --- | --- | --- |
| Tools Outcome Category | Levels 1-3Up to 5 years | Levels 4+Over 5 years | ANOVA |
| Blogs *n* = 33 | *n* = 19 | *n* = 14 |  |
|  | *M* | *SE* | *M* | *SE* | *p* |
| Participation | 3.36 | .13 | 3.20 | .14 | .39 |
| Academic Achievement | 3.44 | .15 | 3.24 | .16 | .38 |
| Satisfaction | 3.32 | .10 | 3.11 | .11 | .17 |
| Discussion Boards *n* = 83 | *n* = 45 | *n* = 38 |  |
|  | *M* | *SE* | *M* | *SE* | *p* |
| Participation | 3.41 | .12 | 3.61 | .13 | .28 |
| Academic Achievement | 3.51 | .13 | 3.82 | .14 | .10 |
| Satisfaction | 3.21 | .10 | 3.43 | .11 | .14 |
| Interactive Tutorials/Modules *n* = 66 | *n* = 38 | *n* = 28 |  |
|  | *M* | *SE* | *M* | *SE* | *p* |
| Participation | 3.22 | .08 | 3.41 | .09 | .13 |
| Academic Achievement | 3.41 | .07 | 3.65 | .08 | **.03** |
| Satisfaction | 3.59 | .09 | 3.93 | .10 | **.02** |

*Note.* 1 = Strongly Disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly Agree

Teachers with more than five years of experience teaching online reported somewhat positive ratings across all three student outcome categories for both discussion boards (participation: *M* = 3.61, *SE* = .13; academic achievement: *M* = 3.82, *SE* = .14; satisfaction: *M* = 3.42, *SE* = .11) and interactive tutorials/modules (participation: *M* = 3.41, *SE* = .09; academic achievement: *M* = 3.65, *SE* = .08; satisfaction: *M* = 3.93, *SE* = .10). Newer online teachers rated blogs somewhat positively as RPT across all three outcome categories as well (participation: *M* = 3.36, *SE* = .13; academic achievement: *M* = 3.44, *SE* = .15; satisfaction: *M* = 3.32, *SE* = .10).

Significant between-group differences were identified for interactive tutorials/modules on academic achievement and satisfaction based on online teaching experience so a post-hoc t-test was conducted. More experienced online teachers reported a higher effectiveness on academic achievement and satisfaction than newer teachers (see Table 8 on following page).

Table 8

*Post-hoc t-Test Interactive Tutorials/Modules*

|  |  |  |
| --- | --- | --- |
| Academic Achievement | Levels 1-3Up to 5 years | Levels 4+Over 5 years |
| Mean | 3.41 | 3.65 |
| Variance | 0.14 | 0.22 |
| df | 50 |  |
| t Stat | -2.192 |  |
| P(T<=t) two-tail | 0.033 |  |
| Satisfaction | Levels 1-3Up to 5 years | Levels 4+Over 5 years |
| Mean | 3.59 | 3.93 |
| Variance | 0.18 | 0.39 |
| df | 44 |  |
| t Stat | -2.409 |  |
| P(T<=t) two-tail | 0.020 |  |

**Barriers to Implementation**

 This study also sought to understand why online secondary teachers may not be using the selected online learning tools to implement RPT in their classes. Table 9 below shows the data for the identified barriers.

Table 9

*Barriers to Implementation of RPT and Online Learning Tools*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Barriers | Blogs*n* = 69 | Discussion Boards*n* = 15 | Social Network Sites*n* = 86 | Wikis*n* = 78 | Interactive Tutorials/ Modules*n* = 22 | Virtual Worlds*n* = 77 | Totals*n* (%) |
| I have not heard of this tool | 1 | 0 | 1 | 0 | 4 | **41** | 47 (8%) |
| I have not received training on how to use this tool | 17 | 2 | 5 | **24** | 5 | 18 | 71 (12%) |
| I have not received guidance in how the tool should be used for educational purposes | 19 | 1 | 16 | **24** | 3 | 15 | **78 (13%)** |
| My administration did not support the use of this technology tool | 0 | 0 | 18 | 0 | 0 | 3 | 21 (3.5%) |
| There was not enough course time to implement the tool | 18 | 5 | 19 | **23** | 5 | 12 | **82 (13.5%)** |
| I did not see the potential of tool | 26 | 5 | **31** | **22** | 2 | 15 | **101 (17%)** |
| I did not have enough time to learn tool | 12 | 1 | 4 | **23** | 6 | 12 | 58 (9.5) |
| I thought the tool would add workload by using it | 7 | 2 | 9 | 9 | 2 | 10 | 39 (6.5%) |
| Other (please specify) | 24 | 7 | **32** | 20 | 6 | 12 | **101 (17%)** |
| Totals *n*(%) | 124 (21%) | 23 (4%) | **135**(22.5%) | **145**(24%) | 33(5.5%) | **138**(23%) | 598 |

 Not seeing the potential of an online learning tool was the most frequent barrier across all six tools (*n =* 101, 17%). Lack of course time to implement the tool was second (*n =* 82, 13.5%) and not receiving guidance for educational uses a close third (*n =* 78, 13%). Participants also felt that the pre-selected barrier options did not adequately express their opinions 101 times (Responses can be read in Appendix C). Commonalties among the inputted answers were: not an option of their CMS, such as Aventa, D2L, or Moodle; and not included as a part of the pre-designed course or content.

 Even though the online learning tool, wikis, was known to all, it had the most barrier identifications (*n =* 145, 24%): not received training (*n =* 24), no guidance for educational purposes (*n =* 24), not enough course time to implement (*n =* 23), potential not seen (*n =* 22), and not enough time to learn tool (*n =* 23). Virtual worlds were least known to participants (*n =* 41) and second in overall barriers (*n =* 138, 23%). Social network sites largest identified barriers were not seeing the potential of the tool (*n =* 31) and self imputed answer (*n =* 32) for a total of 135 barrier occurrences (22.5%). Teachers’ open responses showed the common concerns of student distraction and lack of control, as well as the CMS providing the needed social aspects within their courses (Responses can be read in Appendix C).

**Chapter 5: Discussion**

The purpose of this study was to investigate how frequently online secondary teachers use selected online learning tools to implement RPT and examine their views on the effectiveness of tool use on student participation, academic achievement, and satisfaction. This study also sought to gain more information about why teachers may not be using certain online learning tools for RPT implementation in their OLE course, in order to offer suggestions that may help schools and teachers be more intentional in their choice of online learning tool use. The findings led to various conclusions, implications, and recommendations about the use of selected online learning tools that allow implementation of RPT in OLE.

**Discussion**

**Research Question 1.** *Which online learning tools are teachers implementing RPT to support constructivist, social, or collaborative learning in OLE?*

 While there are online learning tools that the literature has proven effective to implement RPT into OLE, this study found online secondary teachers are not implementing them at all. For instance, the vast majority of participants had never used wikis. Very few used wikis in their courses with any regularity, which seems to contradict the RPT value stated in previous research, as well as wikis’ ability to be employed in a variety of Bloom’s taxonomy learning stages: understanding, applying, analyzing, and creating (Churches, 2009). Hadjerrouit (2012) argued that wikis function as a social learning environment, which promotes learning that is more effective than the sum of the individual work through student contribution and collaboration. Hewege and Perera (2013) showed with their research of Net-Gen students that wikis enriched the learning among students, accommodated different opinions, allowed students to express themselves, gave space and opportunities to shape independent thinking and critically assess relevant issues. Hazari et al.’s (2009) research showed wikis’ leadership opportunities, variety, and innovative collaborative features in a web-based learning environment. The low usage by these participants raise questions as to why wikis are not being used even though they can serve as a platform for students to work together, share information, and construct new knowledge.

While the vast majority of participants in this study did not use wikis, discussion boards were used by the vast majority. These supports Freidhoff’s (2008) argument that discussion boards have the particular advantage of being a part of a CMS, thereby allowing students access to them when enrolled in an online class. The relative ease that teachers can create discussion boards may play a part in their frequent use. Participants also noted in their open responses that the course designer or school had already created the discussion boards they use, thereby removing this burden from the teacher while simultaneously ensuring the use of this tool. The frequent use of discussion boards supports its use as RPT for reflection, interaction, participation, community building, and content sharing (Alghamdi, 2013; Freidhoff, 2008; Hazari et al., 2009; Im & Lee, 2004) in the constructivist, social, and collaborative paradigm of OLE.

Interactive tutorials/modules were also used by the majority of participants. These are typically created by an outside company, which would save teachers’ time, much like discussion boards. This timesaving trait may also affect its use, as Hammerness (2004) found that there are increasing requirements and significant pressures that teachers face daily. The high usage supports interactive tutorials/modules as RPT as they allow visualization of complex or abstract topics, self-paced work with formative assessment, engagement with different audio and visual techniques, and interaction with content in a meaningful way (Lee & Osman, 2012; Skagen et al., 2008; Tillander, 2011). The teachers in this study frequently took advantage of this online learning tool to apply RPT and put students at the center of the learning experience, as well as increasing self-paced interaction with content and materials in the constructivist, social, and collaborative paradigm of OLE.

Blogs were used by a third of participants in this study. Blogs, while they are student controlled, can be time consuming to initially set up. Teachers must utilize an aggregator so that they can login to one website to check for tagged student posts, a task similar to checking one’s email when set up properly. Perhaps this is unknown to teachers or beyond the technology comfort level, which may explain the lower usage of blogs as RPT in the secondary OLE. This lower use of blogs seems to contradict Freidhoff’s (2008) report that blogs are extremely popular and 38% of 12 to 17-year-olds read them, while 19% maintain their own, as well as their RPT usage in a number of Bloom’s taxonomy stages: remembering, understanding, evaluating, and creating (Churches, 2009).

Virtual worlds had never been used by almost all participants. While Schiller (2009) and Twining (2009) both used Second Life to show its ability to access and use learning materials not readily available in real life, complete tasks impossible in real life, feel involved, interact with more comfort and ease, as well as empower the user with choice, the lack of use reported in this study seem to indicate that these participants have not embraced virtual worlds as RPT. Perhaps the lengthy and in-depth programming involved in creating a virtual world for a class or school is to blame as Schiller (2009) showed, “many educators, especially those who are new to Second Life, are struggling with the design and implementation of Second Life’s components into teaching and learning” (p. 371). Therefore, while virtual worlds may be able to serve as an innovative environment to facilitate learning, the low usage found in this study may show that they are too time consuming for individual teachers to create and employ.

A similar concern arose with participants in regards to the use of social network sites for education purposes. Again, almost all of participants had never used them in their secondary online courses and gave such reasons as too time consuming to patrol and concern of student exposure to non-related content. This fails to address the fact that many young people today already use social network sites and employing them into OLE could capitalize on students’ preexisting habits and skills. For instance, many already monitor their online presence for new activity or comments often, so creating a class Facebook**™** could actively engage students, share content, interact, and build a sense of community (Casey & Evans, 2011). Ng’ambi (2013) showed that incorporating a social media site into education transformed the teaching and learning process, as well as extended student engagement in regards to time and individuals as it reached outside the class to include professionals. The extremely low usage found in this study seems to contradict these RPT applications of social network sites, as teachers tend to employ RPT that they deem valuable.

In regards to why teachers are not implementing RPT through these online learning tools, the findings indicated that there are common barriers that online secondary teachers face. The most prominent barrier that participants identified across all online learning tools was ‘I did not see the potential of tool’. As Churches (2009) stressed, tools are just the medium that teachers use to support students to achieve, recall, understand, apply, analyze, evaluate, and create. If teachers do not understand how a tool can benefit their students, they most certainly will not employ it in their courses.

Relating closely to the top identified barrier was the third highest occurring: I have not received guidance in how the tool should be used for educational purposes. Hewege and Perera (2013) argued that the major weakness for tool implementation is weak assessment strategies. This points to the importance of teachers planning what educational outcomes the students will attain through the use of the tool and how they will judge that attainment. Having training that clearly explains how an online learning tool can be capitalized as RPT in an online course could help overcome this barrier, as it would identify education uses.

Another prominent barrier the participants identified was: there was not enough course time to implement the tool. This supports findings that there are many skills, course objectives, as well as increasing requirements and significant pressures that teachers face daily (Hammerness, 2004).

**Research Question 2.** *How does RPT and tool use affect the specific learner outcomes of student participation, academic achievement, and satisfaction?*

Only the top three frequently used tools were evaluated for RPT impact because the low number of teachers using wikis, virtual worlds, and social network sites, made it difficult to get an accurate view of the tool’s effectiveness as RPT on the aforementioned learner outcomes. The difference in tool use seems to indicate that there is a common set of online learning tools that participants found to be more effective than others to implement RPT in OLE.

***Blogs.***

Joshi and Babacan’s (2012) research showed blog use increased interaction, thereby removing students from being passive recipients of information. Teachers in this study concur as they reported a somewhat positive affect on student participation with the use of blogs, with its highest rating in students interacting and connecting with each other. Teachers also reported a somewhat positive affect on student satisfaction which could support the findings that blogs are personally meaningful and encourage learner ownership through control, while also sustaining writing beyond the requirements of the course (Freidhoff, 2008; Joshi & Babacan, 2012). Furthermore, teachers reported a somewhat positive affect throughout all academic achievement questions by using blogs as RPT, particularly with it aiding students to achieving course objectives, which supports Freidhoff’s (2008) study that showed containing student writing in one area allowed for continual monitoring and making connections across topics.

***Discussion Boards.***

Participants reported discussion boards to have a somewhat positive overall positive RPT impact in academic achievement. This supports Alghamdi’s (2013) study which showed increased knowledge of course content and raised post-test scores in the students who used discussion boards. Participants also reported positive effect on participation, mirroring Hazari et al.’s (2009) study that supported discussion board’s use to promote student participation and community building. Satisfaction was also somewhat positively impacted by the use of discussion boards, particularly in regards to it being a positive experience for students, which supports the findings that discussion boards break down barriers for students to interact and remove feelings of embarrassment, which not only can raise self-esteem, but also allow for more cognitive development (Alghamdi, 2013; Hazari et al., 2009; Im & Lee, 2004).

***Interactive Tutorials/Modules.***

Overall, participants reported the use of interactive tutorials/modules to have a positive impact on student satisfaction, particularly in response to students viewing its use as a positive experience, as well as engaging and useful. This supports research which showed that allowing students to work at their own pace through tutorials, along with tutorials use of audio and video, can motivate students (Lee & Osman, 2012).

Interactive tutorials and modules also received somewhat positive scores for its RPT impact on academic achievement in the questions that reflected individual work. However, it received the low ratings as RPT for those questions that reflected academic achievement through sharing or working together. These results support the findings that tutorials and modules have been shown to express content in meaningful ways and deliver it effectively to individual students, but are not meant for collaborative learning (Doering et al., 2009; Lee & Osman, 2012; Skagen et al., 2008). Furthermore, Lee and Osman (2012) showed increases in both intrinsic and extrinsic motivation while using an interactive module, which is supported by these participants reporting a positive rating in the participation outcome category.

There was statistical difference between the groups when based on experience teaching online, with more experienced teachers rating a higher effectiveness of interactive tutorials/modules as RPT for academic achievement and satisfaction. Perhaps participants were better able to effectively utilize this tool to implement RPT with their students as they became more experienced teachers.

**Implications**

When looking at which online learning tools secondary teachers are choosing to implement RPT through, the frequency with which teachers use blogs, discussion boards, or interactive tutorials/modules implies that teachers find value in having students use these tools. This is confirmed by the data related to the second research question, where teachers found these tools to have a generally positive impact on student participation, academic achievement, and satisfaction based on the means. The percentages of teachers that never use social network sites, virtual worlds, or wikis can lead to the implication that the teachers either do not find value in having students use these online learning tools or have not yet been exposed to their uses as an educational tool, and therefore do not implement them in their courses.

This study found the commonalities among the top barriers indicate that teachers are not aware of online learning tools or how they can be used for educational purposes. It can be inferred that if teachers were aware of what other teachers have implemented effectively, some of these concerns concerned can be eliminated. The most common barrier was not seeing the potential of the tool. Another common barrier was not receiving guidance on how to use the tool for education. Both imply that a lack of training exists for online secondary teachers to chose and effectively use online learning tools for their educational outcomes. A third common barrier was lack of course time. It can be inferred that because teachers have many course requirements and skills that need to be taught, they have a difficult time including it all.

**Limitations**

There are some limitations of this research study that need to be acknowledged. The study relies on self-report data (Leedy & Ormrod, 2013). The data is based on teacher perceptions of effectiveness and therefore is limited to their knowledge, experience, and honesty. The survey research conducted for this study is limited to teachers’ perspectives at one specific time of year. The multiple comparisons conducted for analyzing data could have increased error read, especially due to the small sample size.

**Recommendations for Future Research**

Even though there was typically no statistical significant difference between the participant groups based on experience teaching online, since one reported higher means than the other, further research is needed to look at the relationship between online teaching experience and influence on student participation, academic achievement, and satisfaction. Future research should also be conducted to further investigate the specific online learning tool that the teachers perceived as most effective for RPT implementation, to determine how effective it actually is when used with online secondary students. Future research is also needed to determine the influence that online teaching experience, as well as educational level, have on teachers’ perceptions of the effectiveness of RPT through the online learning tools, how often they utilize them, and the barriers that hinder use.

**Conclusions**

 Even though research showed all six online learning tools in this study were effective for implementing RPT into OLE, not all are being used by online secondary teachers. There needs to be more research done to investigate this gap. Based on participants use, it seems that teachers utilize tools in which they find value and which positively impact their students. The three most used tools (blogs, discussion boards, and interactive tutorials/modules) were all rated as generally contributing positively to student participation, academic achievement, and satisfaction based on the means, thereby supporting their RPT use in OLE.

 The commonalities among the top identified barriers point to a lack of teacher training in online learning tools, as well as their potential educational uses. Sarachan (2011) pointed out that selecting such things as software, assessment options, and content choices, are better made when one is exposed to others’ experiences. Therefore, learning about other teachers’ experiences, as well as understanding what other teachers have tried and found successful, will benefit future online teachers, which is one of the intentions of this study.

Hewege and Perera (2013) argued that the major weakness for tool implementation is weak assessment strategies. This points to the importance of teachers planning what educational outcomes the students will attain through the use of the tool and how they will judge that attainment. Having training that clearly explains how an online learning tool can be capitalized as RPT in an online course, as well as how they align with Bloom’s taxonomy, could help overcome this barrier, as it would identify education uses and learner achievement.

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**Appendix A**

**Sample Survey Instrument**

Instructions: Please answer the following background information by indicating (√) where applicable:

Are you?

\_\_\_\_\_ Male

\_\_\_\_\_ Female

What is your age range?

\_\_\_\_\_ 18-25

\_\_\_\_\_26-45

\_\_\_\_\_ Over 45

What is your education level?

\_\_\_\_\_ Bachelor’s Degree

\_\_\_\_\_ Bachelor’s degree plus additional credits master’s degree

\_\_\_\_\_ Master’s degree plus additional credit

\_\_\_\_\_ Doctorate degree

What grades do you teach online?

\_\_\_\_\_ 7-9

\_\_\_\_\_ 10-12

\_\_\_\_\_ Other (with area for teacher to input)

How many years have you been teaching online?

\_\_\_\_\_ Less than 1 year

\_\_\_\_\_ 1-2 years

\_\_\_\_\_ 3-5 years

\_\_\_\_\_ 5-10 years

\_\_\_\_\_ 11-15 years

\_\_\_\_\_ more than 16 years

How many years have you been teaching altogether?

\_\_\_\_\_ Less than 1 year

\_\_\_\_\_ 1-2 years

\_\_\_\_\_ 3-5 years

\_\_\_\_\_ 5-10 years

\_\_\_\_\_ 11-15 years

\_\_\_\_\_ more than 16 years

How would you classify your experience with Web 2.0 tools, i.e. blogs or wikis?

\_\_\_\_\_ Beginner

\_\_\_\_\_ More than a beginner, but less than intermediate

\_\_\_\_\_ Intermediate

\_\_\_\_\_ More than intermediate, but less than expert

\_\_\_\_\_ Expert

What is your technology comfort level?

\_\_\_\_\_ Beginner

\_\_\_\_\_ More than a beginner, but less than intermediate

\_\_\_\_\_ Intermediate

\_\_\_\_\_ More than intermediate, but less than expert

\_\_\_\_\_ Expert

Explanation regarding survey design:

After completing the above background questions, the participant was directed to answer the question: “How often have you used [specific tool inserted] in your online class?”. If the participant indicated that they never used a tool, they were routed to the question: “Since you have not used [specific tool inserted], please indicate (√) for all that apply for why you may not have used this tool:” to share reasons for why not. If participant indicated that they have ever used a tool, regardless of frequency, they were routed to the matrix question on the following page to indicate their perceived student impact of the online learning tool. Upon completion of the matrix questions for one online learning tool, the participant would be directed to the next online learning tool (Blogs, Discussion Boards, Social Network Sites, Wikis, Interactive Tutorials/Modules, Virtual Worlds), beginning with the question: “How often have you used [specific tool inserted] in your online class?”

**Instructions: Please answer the following information by indicating (√) where applicable:**

**How often have you used [specific tool inserted] in your online class?**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Daily | Weekly | Monthly | 2-3 times a course | Once a course | Never |
| 0 | 0 | 0 | 0 | 0 | 0 |

**Since you have not used [specific tool inserted], please indicate (√) for all that apply for why you may not have used this tool:**

\_\_\_\_\_I have not heard of this tool

\_\_\_\_\_I have not received training to use the tool

\_\_\_\_\_I have not received guidance in how the tool should be used for educational purposes

\_\_\_\_\_My administration did not support the use of this technology tool

\_\_\_\_\_There was not enough course time to implement the tool

\_\_\_\_\_I did not see the potential of tool

\_\_\_\_\_I did not have enough time to learn tool

\_\_\_\_\_I thought the tool would add workload by using it

\_\_\_\_\_Other (with area for teacher to input)

**Please respond to the following statements regarding the use of [specific tool inserted] and its impact on your students:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Indicate (√) one choice from the scale with SA being Strongly Agree and SD being Strongly Disagree for each statement.** | Strongly Disagree | Disagree | Neither Disagree or Agree | Agree | Strongly Agree |
| Use of this tool helped students to interact more with materials/content | 0 | 0 | 0 | 0 | 0 |
| Use of this tool encouraged collaborative learning | 0 | 0 | 0 | 0 | 0 |
| Use of this tool resulted in students completing assignments on time | 0 | 0 | 0 | 0 | 0 |
| Use of this tool resulted in students interacting and connecting with other students | 0 | 0 | 0 | 0 | 0 |
| Use of this tool increased student engagement  | 0 | 0 | 0 | 0 | 0 |
| Use of this tool increased information sharing among students | 0 | 0 | 0 | 0 | 0 |
| Use of this tool aided in achieving course objectives | 0 | 0 | 0 | 0 | 0 |
| Learning was enhanced by use of this tool | 0 | 0 | 0 | 0 | 0 |
| Use of the tool resulted in improvement in students’ knowledge of the content | 0 | 0 | 0 | 0 | 0 |
| Students contributed to each other’s learning through this tool | 0 | 0 | 0 | 0 | 0 |
| Students were frustrated with use of this tool | 0 | 0 | 0 | 0 | 0 |
| Students were motivated to use tool | 0 | 0 | 0 | 0 | 0 |
| Students were excited to use this tool | 0 | 0 | 0 | 0 | 0 |
| Students found the tool to be engaging and useful | 0 | 0 | 0 | 0 | 0 |
| Use of this tool was a positive experience for students | 0 | 0 | 0 | 0 | 0 |

**Please respond to the following statements regarding the use of [specific tool] and your response to its use as the teacher.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Indicate (√) one choice from the scale with SA being Strongly Agree and SD being Strongly Disagree for each statement.** | Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly Agree |
| Tool increased ability to reach students | 0 | 0 | 0 | 0 | 0 |
| Tool impacted my knowledge of content positively | 0 | 0 | 0 | 0 | 0 |
| Tool increased my confidence with technology | 0 | 0 | 0 | 0 | 0 |
| I enjoyed using the tool | 0 | 0 | 0 | 0 | 0 |
| Tool frustrated me | 0 | 0 | 0 | 0 | 0 |
| Students took ownership of learning through use of tool | 0 | 0 | 0 | 0 | 0 |
| Use of this tool added value to my course | 0 | 0 | 0 | 0 | 0 |
| This tool helped me reach individual students’ needs | 0 | 0 | 0 | 0 | 0 |
| Tool allowed for formal and informal learning  | 0 | 0 | 0 | 0 | 0 |

Please share how you have used this tool in your classes. (open-ended teacher input question)

**Appendix B**

**Participant Contact Letter with IRB Approval**

Subject line: Help online teachers in the future

Good morning,

I am appealing to you for your help. I am not asking for funds, merely for a few moments of your time.

Your director, [name], has graciously allowed me to contact [school name’s] teaching staff in order to gain feedback that will help online teachers in the future. I have an online questionnaire that seeks to obtain your honest opinion of Web 2.0 tools’ strengths and weaknesses. It should take at most only fifteen minutes of your time.

Thank you in advance for your kind assistance. Please don’t hesitate to contact me at 651-216-6922 or ljdolphy@gmail.com if you have any questions for concerns.

You may access the online questionnaire here: [SurveyLink]. By doing so, you voluntarily agree to participate in the study.

Respectfully yours,

Leia Dolphy

Consent to Participate in a Research Study

University of Northwestern – St. Paul

Saint Paul, MN 55113

TITLE OF THE RESEARCH PROJECT: A comparison of teacher views of the use, barriers to use, and the effectiveness of selected research-based pedagogical techniques implemented through Web 2.0 tools in the online learning environment on student participation, academic achievement, and satisfaction

Principal Investigator: Leia Dolphy, MAED graduate student @ University of Northwestern – St. Paul

Co-investigator: none

Faculty Advisor: Dr. Ying W. Shen, Associate Professor of Education, UNWSP

Invitation to participate in a research study

Leia Dolphy, MAED graduate student at University of Northwestern – St. Paul, invites you to participate in a research study about the effectiveness of selected research-based pedagogical techniques through the use of Web 2.0 tools in the online learning environment on student participation, academic achievement, and satisfaction, along with barriers to implementation.

The study is not funded, but is a part of the completion of Leia Dolphy’s master’s degree.

Description of subject involvement

If you agree to be part of the research study, you will be asked to click on the survey link contained in the above email and answer questions regarding your observations when using specific Web 2.0 tools, such as blogs and wikis, during your online courses. Background information, barriers to tool implementation, and teacher feedback will also be collected.

Benefits

Although you may not directly benefit from being in this study, others may benefit because this study should provide a list of evidence-based Web 2.0 tools that can be used to positivity impact student participation, academic achievement, and satisfaction, as well as give suggestions to overcome barriers to tool implementation that teachers may face.

Risks and discomforts

There are no risks associated with this study because the data collection is completely anonymous and the topic is not sensitive.

Compensation

There is no monetary compensation for participation in this study.

Confidentiality

I plan to publish the results of this study in my master’s research capstone project, but will not include any information that would identify you.

To keep your information safe, the researcher will contain all data on a personal laptop with limited access to only the researcher. Identifying markers will be removed and replaced with numerical coding.

Storage and future use of data

The data you provide will be stored on a personal laptop, with limited access to researcher only.

The researcher will retain the data/specimens for the remainder of 2014.

The researcher will dispose of your data/specimens by January 30th, 2015.

The data/specimens will not be made available to other researchers for other studies following the completion of this research study and will not contain information that could identify you.

Voluntary nature of the study

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. If you decide to withdraw early, your data will be removed from the study.

Contact information

If you have questions about this research, you may contact Leia Dolphy, ljdolphy@gmail.com, C: 651-216-6922, or faculty advisor Dr. Ying W. Shen, Associate Professor of Education, UNWSP, P: 651-286-7514, ywshen@unwsp.edu

If you have questions about your rights as a research participant, or wish to obtain information, ask questions or discuss any concerns about this study with someone other than the researcher(s), please contact the University of Northwestern Institutional Review Board, 3003 Snelling Avenue North, Saint Paul, MN 55113 or Don F. Johnson, 651-631-5693 (dfjohnson@unwsp.edu).

Consent

By clicking on the study link here: [SurveyLink], you are agreeing to be in the study.

Please print a copy of this email for your records.

Be sure that questions you have about the study have been answered and that you understand what you are being asked to do. You may contact the researcher if you think of a question later.

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.

[RemoveLink]

**Appendix C**

**Survey Open Responses for Barriers**

Blog Barrier Open Responses:

* It really doesn't fit in with the courses, with the exception of Creative Writing - but then students are so busy, I try not to ask anything extra of their time.
* I teach health and phy ed. We have not used it yet but may use it for health assignments in the future.
* I know there's much more that one can do with blogs, but since it's my first year with online teaching and I'm not already familiar with them, I decided not to add anything to the curriculum. In the future, I would be interested in trying it.
* Still learning how to implement it
* I haven't specifically designed an online course to use this tool yet.
* My class sizes are generally very low (1-5). Everything I could put on a blog I can imbed in my course.
* The D2L platform uses discussion boards not blogs.
* The scope of the courses I teach really do not have the time built in to accommodate something like this.
* Not sure of the usefulness of the tool for math.
* I teach special ed- they can't read blogs
* I teach math and haven't come across a blog I feel would be useful to my classes
* The course I use is a purchased package and has a discussion activity that is used instead of an actual blog.
* I teach a very small special education class.
* I teach an online course that has already been created.
* The courses I teach do not lend themselves to blogs, but I do use "chat" tools and discussion groups.
* The Aventa course is pre-defined and does not include a blog. Also, because I do rolling enrollment, students are not at the same place in the course so a blog would not be relevant
* For the course that I teach, blogs did not seem to be a good fit. I utilize the discussion board for communication between students and between the students and teacher
* Use discussion forums instead--kind of like blogging.
* My curriculum is pre-set so I do not have a lot of say in the tools that I use.
* Just didn't/don't see it fitting into a math class
* I utilize other tools that I find more useful for my current students. I am not against blogging, it just doesn't fit my curriculum at this time.
* I don't see the necessity of it.
* The K12 curriculum was pre-set and students never did any optional activities we created. 80% were failing as it was, so asking them to do extra work was not an option.

Discussion Board Barrier Open Responses:

* We may use in the future
* My classes are specifically set up to not use discussion tools.
* Still learning to implement it
* students can't read- Special Ed
* all of our meetings are real time, so a discussion board has not been needed
* not a need based on the course

Social Network Sites Barrier Open Responses:

* Just haven't seen it implemented in my online courses, did use social network sites in traditional classroom, but they were not that helpful
* Social networking sites tend to be a distraction (and sometimes a time waster) for many students, so I do not include that aspect into my courses.
* May use when related to social health topics
* I only have two students in my course, and both of them are non-traditional students. They seem to have enough to do in just logging in to the course without adding outside networking. I would not be opposed to them using it to get to know each other better.
* We are just starting to get our Facebook page up and running more consistently.
* Still learning to implement
* Prefer a controlled environment. This is too fraught with unknowns and potential troubles.
* I felt that the discussion board in d2l was very much like social networking. It would have been redundant and time consuming to use other options.
* As far as I know, in my online courses, I have not heard if using Social Network Sites is approved to be used. However, in the classroom, I believe they can prove to be a great way to communicate what is happening in regards to instruction and activities. I have not personally used it in my classroom instruction, but my own kids' teachers have and I LOVE IT as a parent!
* I did not see that it would enhance the learning of my students.
* I don't see the value of Social Network Sites use in education
* I did not see the need. Our D2L platform allows for interaction already.
* Concern over the ways in which the students interact with social networking sites.
* I think there are ways to be social within a course that do not involve the use of well known social networking sites (there are a few exceptions - such as twitter for good information). I see the value in some separation of school time on the computer and social time on the computer. A good LMS will allow social interaction within the school site.
* Moodle basically is a social network site with forums and chat
* No real application for French students.
* we meet all real time, so in regards to social networks we have not had the need for them
* Do not feel it is a good fit for my current online course.
* I teach a small class of three or four active students at a time. I am nervous about the school's liability to what is posted on Social network sites.
* Not appropriate for the type of course that I teach. I use these tools in other courses with success.
* My students have enough to check and keep track of in their course, adding a social network to this would be cumbersome, in my opinion. We stay in contact through the LMS provided as well as email. This has worked well.
* The courses I teach online are already created.
* I do not want to police a social network site in another language. Students do enough of this on their own, I have more important learning tools in my course.
* It is not included as part of the Aventa curriculum
* Not part of course work.
* I have not seen a use for this tool given all of the tools that D2L offers.
* I use social network sites for my professional knowledge in order to stay on top of current trends. I don't use it with my students because it is too much to track with all of the other responsibilities I have.
* Just don't see the need
* The K12 curriculum was pre-set and our students did not complete the necessary work, not to mention any thing optional. Had we been allowed by the district to use Schoology, social networking without the legal liabilities of Twitter, etc., we would have. But we were not allowed.
* "Social" visiting- off task

Wikis Barrier Open Responses:

* I have no need for the use of a Wiki in my online class.
* During our training for the online course, my administrators said that these can be useful for some courses, but they weren't sure how helpful they would be for my course. I don't see a lot of potential for wikis in my classes.
* Still learning to implement
* My course is built. There is no room for this...and it would add to my workload to implement, and oversee it.
* I am a SPED teacher and do not see the need for this tool.
* Wikis in terms of information gathering aren't perfect in their reliability. Wikis in terms of helpings students to collaborate to create a central project are just one of many options to do this, and not the strongest of them.
* I question how useful they are to students when much of what I imagine would be in the wiki is already available in the course.
* Not as useful to a math class.
* This tool is out of date. If I were to have a student create a webpage to share content (the whole purpose of a Wiki), I would have them use some other type of presentation tool such as a Tackk or a Prezi. Even Google Presentation is better than a Wiki, in my opinion. Wikis would be great for group projects but we don't often create collective work that should be shown all together.
* My course is already created and does not include these.
* The classes I teach already have the curriculum written and they do not incorporate Wikis and I am not able to make changes to the curriculum.
* Not included with the Aventa course
* not part of course work.
* I have found no need to add this to already rigor is course structure.
* D2L offers everything I need.
* I don't like the way wikis can be edited. Because I teach Health and Physical Education courses, I want concrete knowledge that does not change for my students.
* I used it once per semester as a way to make a course check list but I found a better tool!
* The K12 curriculum was pre-set and the students did not complete even required components, not to mention optional. 80% of our students were in danger of failing. My work was remediation, not adding more.
* Every student takes time away from coursework to use all these different learning tools. Technology hardware/access varies.

Interactive Tutorials/Modules Barriers Open Responses:

* I don't have the skill to create tutorials.
* I am just getting into these through the use of ScreenCastoMatic. I do regular Black Board Collaborate Sessions with my students though.
* with project based learning have not had the need
* This topic could cover a wide range of materials. I have supplemental websites and "out of course activities" that I do use but none are listed or labeled as Interactive Tutorials/Modules so I do not believe I use them.
* No access.
* I use a number of sites in my course that have interactive features for the students, but am not sure that these are considered "Web 2.0"

Virtual Worlds Barriers Open Responses:

* I once tried using Google Trips and at the time, it caused issues with my computer. I've heard it is better now, but I haven't had time to verify that.
* Only Virtual World I'm familiar with, Second Life, seems full of adult and inappropriate content.
* because I have 3 days/week of face time, this is not as necessary perhaps than if we were 100% online
* I have yet to find virtual worlds that are free for use and protect my students from non-school appropriate material.
* If I had time, I would like to find a virtual world that would assist in meeting the standards in my courses.
* I see no benefit of this in my classroom.
* Courses already created without this tool
* No need to in my content area. The curriculum is already quite rich and heavy in content.
* Not part of the Aventa course
* I have not come across relevant applications.
* not part of content
* The K12 curriculum was pre-set and 80% of our students were in danger of failing and not completing the basic assignments. My job was remediation every week - there was no time to add more and the students would not do any of the optional work I did offer.