

Fall 12-15-2011

# Twenty-First Century Learning: Is Project Based Learning the Learning of the Future?

Rebecca Ringrose  
*Coastal Carolina University*

Follow this and additional works at: <https://digitalcommons.coastal.edu/honors-theses>

 Part of the [Special Education and Teaching Commons](#)

---

## Recommended Citation

Ringrose, Rebecca, "Twenty-First Century Learning: Is Project Based Learning the Learning of the Future?" (2011). *Honors Theses*. 111.  
<https://digitalcommons.coastal.edu/honors-theses/111>

This Thesis is brought to you for free and open access by the Honors College and Center for Interdisciplinary Studies at CCU Digital Commons. It has been accepted for inclusion in Honors Theses by an authorized administrator of CCU Digital Commons. For more information, please contact [commons@coastal.edu](mailto:commons@coastal.edu).

TWENTY-FIRST CENTURY LEARNING: IS PROJECT BASED LEARNING,  
THE LEARNING OF THE FUTURE?

BY

REBECCA RINGROSE

Special Education

---

Submitted in Partial Fulfillment of the  
Requirements for the Degree of Bachelor of Science  
In the Honors Program at  
Coastal Carolina University

December 2011

### Abstract

Project based learning (PBL) allows students preschool to grade twelve to get involved in research projects in a hands-on manner. Project based learning provides students with access to a wide variety of technology to use to collect information, analyze data, and present their research. Twenty-first century skills is a goal for PBL projects which include team work and critical thinking to encourage students to become more interested in what they are studying. PBL is being used at Myrtle Beach High School by seventy-five tenth grade students in the subjects of English, Math, and Social Studies. The projects the students are involved in are integrated into all three of these subject areas. This study researches how often students in a tenth grade PBL English class attend class compared to the students in a tenth grade traditional English class. This was done through the collection of attendance records each day, throughout the 33 days of this study. This study also looked at how both sets of students perceive PBL at their high school, based on their responses to eleven questions on a survey given to them by the researcher. They were asked to rate their perceptions about PBL and the use of technology to complete assignments. The study found that students in the PBL class have a higher rate of attendance than that of their peers in a traditional class. As well as the fact that students at Myrtle Beach High School, especially those in PBL classes, perceive PBL as a positive teaching and learning model.

### Twenty-First Century Learning: Is Project Based Learning, the Learning of the Future?

Being an educator takes a lot more than just providing students with information. In today's modern world teachers need to find ways for students to grasp and enjoy the content they are learning. A way to do this is to introduce project based learning into school systems for students with and without disabilities. Project based learning (PBL) is an instructional tool used in classrooms to get students interested in what they are learning about. PBL uses the *hands on* approach to engage students into developing a better understanding of a certain topic. PBL is a way for students to select a topic they are interested in and develop their own way of researching and answering their own questions about the topic. PBL helps students build the skills they need to complete research projects in a fun independent manner (Thomas, 2000).

PBL is being used at Myrtle Beach High School, in Horry County, SC, by 63 tenth grade students. Myrtle Beach High School is the only school in South Carolina to currently be using PBL; this is only the second year PBL is being used at the high school. These tenth grade students have the opportunity to use PBL in the subjects of English, Social Studies, and Math. The topics the students use PBL for are aligned with South Carolina State standards. Each PBL topic is usually cross-categorical, allowing the students to involve all three subjects. As a part of their PBL program, these students are able to use a wide variety of technology in the classroom, such as flip cameras, Apple and Dell laptops, SmartBoards, digital movie maker software, Edmodo, the Internet and Interwrite Boards. These technologies allow the students to have access to a much wider range of information. They also provide the students with ways to portray that

information in a high tech fashion, ultimately making them become twenty first century learners, which is crucial for success after high school in today's world.

At Myrtle Beach High School, PBL is currently being used to help students make the leap from school to jobs. It is helping to prepare them by building their twenty-first century skills and engaging them in their community and school more. PBL projects begin with an entry event such as reading a novel in English class with a theme that can then be carried into their other subjects, Math and History. The projects can be short and only last one or two days or they can be much larger and last several weeks.

During those longer projects the classes are broken into teams, team being assigned with a team manager. The team manager is essentially the "boss" and is in charge of keeping his or her team moving. The manager has the right to fire any member of the team who is not doing their job, and then that person must do the project alone. The project manager is also responsible for meeting with the teachers and discussing how their team is progressing. Myrtle Beach High

School's goal for these teams is to instill the idea of teamwork in each of their students but also prepare them for the working world. The teachers still teach explicit lessons during class time, focusing on whatever each team might need help with at that time. Each team is given the same theme to work with; however, each group comes up with their own way of presenting the material. In order to do this, the teams are given the right to pick the technology they would like to use for their projects.

At the end of the school year the teams are asked to present their projects, which can incorporate things such as movies, power point slide shows, t-shirts that they have made, posters, and podcasts. The groups present their projects several times; the first times is to each other throughout their three subjects, the teachers collaboratively pick a class day where all 75 of the students come together throughout all three class periods and present their projects. The second time is to the faculty and administration at Myrtle Beach High School who in turn grade the students on their projects. The third presentation is done in the community; the students present their projects to someone or an agency attached to the theme or subject of the projects, such as Waccamaw Mental Health with a project about domestic abuse, this agency or group of people from the community also grade the students on their presentations.

Although this seems like a great deal of pressure for the students to be judged so many different times, it provides them with a lot of feedback but also gets them used to people in the community having a say in what they are working on. The main goal Myrtle Beach High School has set for the PBL program is to get the students into the community more and more each year as they progress in the program, so by their senior year rotation in PBL they will be fully immersed in the community doing a service project that is giving back.

There are two questions that this study is going to try and answer, is PBL having students attend class more often than students without PBL? And do students and teachers at MBHS perceive PBL as a positive aspect that improves their ability to learn in English Language Arts? Over the course of this project, these questions will be researched through attendance records

and the project will also look at how the students and the teachers, in PBL and in traditional classes, feel about PBL through surveys.

The hopes of this study are to see how the students and teachers feel about PBL whether or not they are involved in the program. After all, if there are negative or positive viewpoints of PBL at Myrtle Beach High School then those viewpoints might sway how long the program is used in Horry County and how many students and teachers actually want to be involved in the program. The expected outcomes of this study are that PBL will encourage students to come to class more often, this is because the students have access to such a wide array of technology, making class more interesting and interactive. At the same time, PBL will hinder the interactions between the teacher and the students; however it will in turn promote better school work by keeping the students interested in what they are learning. As for viewpoints of PBL, it is looked at as a different type of class and many students do not want to be labeled as different or stick out. PBL may be looked at in a negative way by the students at Myrtle Beach High School.

### **Literature Review**

Project based learning is a way for educators to challenge their students and get them to work hands on with their projects. According to Thomas (2000), PBL is learning based on projects, the teacher assigns a difficult task designed to challenge the students thinking. This creates a situation for students to problem-solve and investigate their topic. The projects designed for PBL are considered to be the curriculum. PBL projects take the place of day-to-day work in the classroom and incorporate multiple subjects into one large project. These projects integrate technology along with the multiple subjects to create a more interesting project. If

students are not following state standards and are learning outside of that curriculum then their projects are not considered PBL. PBL is designed to make students strive to find answers to difficult questions. A PBL project has students investigate a realistic topic independently (Thomas, 2000).

### Description of PBL

PBL is a way for students to use their critical thinking skills to solve problems in project form, much like any other research based classroom interventions PBL is based on certain guidelines and principles. According Mergendoller and Thomas (2000), there are key themes and principles needed by classrooms using PBL. Much like any classroom, there must be a plan in place to manage a classroom using PBL. According to the interviews conducted in this article, teachers who use PBL in their classrooms came up with seven themes on management for PBL classrooms. These themes include time management and starting projects to emphasize self management among the students and managing student groups. All of these themes address the guidelines step-by-step that classroom teachers go through during the PBL process (Mergendoller & Thomas, 2000). This information is especially helpful considering it has come from teachers using PBL in their classrooms.

Teachers emphasized in their interviews that PBL classroom management is very different from using the traditional teaching model. When using PBL, students spend the majority of their time working in their small groups rather than doing seatwork or listening to instruction. Teachers using PBL typically do not lead instructional activities or dispense resources. Their students conduct their own research and secure their own feedback



(Mergendoller & Thomas. 2000). For some teachers, this is difficult to get used to since it is so different from traditional teaching. However, by allowing the student to be so independent, the students begin to understand the concepts of time management and self management. Students have to be responsible for their own deadlines and work, teaching them to prioritize.

A way teachers can get involved in the PBL process is by helping students with their groups and managing them. Each group is responsible for their own work and has to learn to work together as a team using technology and their resources. Teachers can help the students by making sure each group is staying on task and managing themselves correctly (Mergendoller & Thomas. 2000).

PBL has three outcomes: learning responsibility, independence, and discipline (Bell, 2010). Part of learning responsibility comes through setting realistic goals and collaborating with group members to achieve these goals. After setting these goals, students must achieve them in a certain timeframe, also teaching them responsibility with discipline. Due to having to work under time constraints in groups, students build collaboration and communication skills which ultimately help them in their everyday lives. PBL is designed to appeal to each student's interests and is academically appropriate for each student. Although PBL is group based, it is also geared to individual's needs by offering many options for technology and resources.

Technology is a major component of PBL, but in order for technology to be helpful during a project, the students need guidance with how and when to use the technology. Technology helps students create interactive presentations but also helps them find reliable sources (Bell, 2010).

### Technology and PBL

As classrooms progress with the modern times, technology has become a much more important aspect in the classroom. PBL integrates technology with its projects as a way to expand student learning. The benefits of using technology in cohorts or small groups is discussed by Aust, Newberry, O'Brien, and Thomas (2005). Small groups using technology allows for more opportunities in the classroom. Using these small groups and having the advantage of technology helps to solve a lot of difficulties both in and out of the classroom. It provides motivation for the groups and creates very little stress on whether or not the individuals have access to the technology since it is being provided to the groups. Due to such an increase in the use of technology in the classrooms, teachers have seen an increase in enrollment as well as success in their classrooms. In order to achieve success, the knowledge of the teacher in using the technologies is very important. There are classes available online for teachers to take about learning how to use the technology in their classrooms, in order to teach their students how to use the technology.

Since teachers' technology literacy range from beginners to expert levels, there are different steps in the small groups to improve knowledge and partner teachers together who can help each other, before working with the students. There is such a need for teachers to have knowledge of the different technologies available for their classrooms, this system can only improve the education these teachers are providing (Aust, Newberry, O'Brien, & Thomas, 2005). PBL has such an emphasis on technology, it is most important that the teachers understand the technology that is available to their students to use.

PBL is not just about including new ways of presenting material to students; it is also a way to provide students and teachers with new resources in different subject areas. According to Narkon, Wells, and Segal (2011), a reading technology resource that teachers can use to help students with their vocabulary skills is the E-Word Wall (EWW). The EWW is an instructional tool for students with learning disabilities and autism spectrum disorders. EWW is an interactive instructional tool that provides the option of creating individualized, engaging, multisensory word study for students. EWW allows students to actively manipulate a presentation software program to view, listen, read, and write words and sentences that contextualize new vocabulary. EWW can be easily created by teachers on PowerPoint, making it inexpensive, and it can be used as a supplemental tool along with the teacher's instruction. EWW words are alphabetized according to the beginning letter of the word. EWW is useful in classroom because it does not take up wall space like a traditional word wall, and it can also be personalized towards each student's likes and needs. There is an auditory component used on EWW that allows the students to hear the letter sounds and how words sound using those letters. EWW also has a visual component, which provides the students with visual cues to help them remember their vocabulary words (Narkon, Wells, & Segal, 2011).

Along with the EWW, another technology resource for teachers to use in their classrooms is discussed by Martin (2008) as the Authors Gallery. The Authors Gallery is a way for students to expand upon their writing with the use of technology and showcase it for others to see. The Authors Gallery uses computers, digital cameras, flash drives and student work. In order to use the Authors Gallery, students first need to select a topic to write about or respond to a prompt given to them by the teacher. Often it is best for students to write about something

personal to them, so they can use the technology to showcase their own lives and feelings.

Making sure the students understand where, when, and who will be able to view their writings will also help them to pick a topic to write about, and how to write it (Martin, 2008).

Zascavage and Winterman (2009) discuss the importance of assistive technology and the use of universal design for learning (Jeffer, Floyd, King & Canter, 2011) in the classroom. Many students transitioning into middle school need extra assistance in their classes; the universal design for learning (UDL) uses technology to assist these students. While planning the student's goals on their IEP or Individualized Education Plan, the universal design for learning calls for the IEP team to select the assistive technologies the student may need during the course of the school year. Some of the most frequently used assistive technologies are speech recognition programs, text-to-speech technology, and word processors to facilitate written comprehension. Speech recognition software (Jeffer, Floyd, King & Canter, 2011), helps students with any type of written expression disabilities; the student reads or says what they would like their typed paper to say to the speech recognition device or microphone and it correctly spells words for them and provides them with a legible written/typed copy. This assistive technology is good to use when students have to write essays or book reports, and have difficulty with writing.

Text-to-speech technology uses auditory software to help students who have difficulties in reading, comprehension, and word recognition (Jeffer, Floyd, King, & Canter, 2011). Text-to-speech technology reads words from document on the computer to the students in an audible voice. This means that students can listen to books, texts books, and assignments on the computer. Text-to-speech can also read word by word as students' type up papers and essays in a

word processor, allowing them to hear any mistakes they might be making along the way. Text-to-speech is a useful technology that can be used in many settings; it can help students while writing their papers, but it also eases the task of reading. The UDL allows students to use assistive technology to improve their educational skills, such as reading and writing (Zascavage & Winterman, 2009).

Technology can also help students with basic math facts by helping to improve their recalling skills (Murray, Silver-Pacuilla, & Helsel, 2007). Technology provides students with a variety of ways to practice math facts; these include games on different websites, such as Math Forum which is hosted by Drexel University. This website has a large selection of math activities, where students and teachers can search by topic, grade level, technology type, and resource type. These games and activities can help students prepare for tests and practice timed activities. Often students like to use manipulatives to help themselves understand problems better. Technology can provide students with virtual manipulatives instead of concrete manipulatives. Virtual manipulatives are engaging and easy to use for students, especially for students who might have difficulty handling concrete manipulatives. Virtual manipulatives allow students to be more independent while doing their work.

Interactive white boards have also proven to help students with their math work (Andrews, 2011). It is important to integrate technology into the classroom and teach students how to use the technology correctly. Interactive white boards are a way to use technology during math. Interactive white boards provide a way for the students to manipulate graphics. The interactive white board allows students to move, re-size, flip, duplicate, and rotate any image or

shape on the board. In order to manipulate these shapes and images in so many ways, students must be taught how to use the board before they can experience it for themselves. An important aspect of delivering math instruction on the interactive white board is modeling for the students. Without modeling in any subject area, students will not know what is expected of them or how to complete assignments especially using new material or technology for the first time (Sabornie, deBettencourt, 2009).

### Parents' Response to PBL

Project based learning does not only effect students and teachers in also has an impact on the way parents see their children's classrooms. PBL is a new concept in classrooms; teachers need to also be prepared to help educate the parents of their students. Runswick-Cole (2008) discusses parental effects on special education. Often parents have views and attitudes towards new things especially when the topic involves inclusion and special education practices. PBL is not specifically geared to special education classes; it can provide students with different resources to help them improve their academic skills. According to Runswick-Cole (2008), parents are scared to allow their students to be involved in inclusive activities. Parents are looking to protect their children, and having them involved in something like PBL might make them look different to other people. This is a much better option for students than a special setting (McLeskey & Waldron, 2000). As more and more students with special education needs are being served in general education classrooms (McLeskey & Waldron, 2000), settings using programs such as PBL can help serve these students' needs better. No two students learn the same way, and it is the job of the school to provide students with their most appropriate settings, including factors such as technology (Runswick-Cole, 2008).

### Students with Learning Disabilities

Technology is important in all school settings, but can also help to bridge the gap for students with disabilities, making their classroom experiences less stressful. Studies have shown that students with learning disabilities often get lost in traditional education practices, according to Boon and Rasheed (2007). Their research shows that students with and without disabilities show improvement in classes that use technology and PBL based activities. Students were asked

to discuss their feelings about using technology in the classroom and how user friendly it was for them. For students to begin using technologies that they will be able to use for the rest of their lives such as word processors, the internet and computers in general are good basic skills that all student should have, regardless of their school placements (Berkeley & Lindstorm, 2011). For students with disabilities, these technologies provide them with new ways to organize and synthesize their work and thoughts. When students have more options in their classes rather than the more traditional activity of taking notes, they become more motivated and often notice improvements in their grades (Boon & Rasheed, 2007).

According to Kennedy and Deshler (2010), students with learning disabilities do better in classroom settings that use technology in some form. This technology can be assistive to their needs or used as instructional tools. These technologies help students to bridge the gaps that they may have missed along the path of their education. As students get older, especially in secondary settings, students become less likely to speak up and ask for assistance so the use of technology in the classroom can help to assist them in numerous ways. Students with and without disabilities can succeed in classrooms that are not set up in the traditional manner that they once used to be; technology can now successfully take the place of a traditional classroom (Kennedy & Deshler, 2010).

### Benefits of PBL

The Illinois Mathematics and Science Academy (2008) reports, "PBL promotes metacognition and self-regulated learning as students generate strategies for defining problems, gathering information, analyzing data, building and testing hypotheses, comparing strategies



with those of other students and mentors, and sharing methods and conclusions." For students across all age groups, there are ways of getting them interested in PBL. For instance, using an aspect of life students or adults are interested in will hold their attention longer, allowing them to really get involved in their PBL projects based on their interests (Illinois Mathematics and Science Academy,2008).

The University of Indianapolis in 2009 found that PBL promotes positive outcomes for students. Students involved with PBL do better on assessments than other students who are not involved in PBL. Students who are struggling in general education curriculum classes appear to do better in PBL situations. Since PBL is interactive it is easier for students to understand concepts that are hard to explore in a paper. PBL has also encouraged students to become more involved in their classes. Technology allows students to express themselves more openly without feeling uncomfortable with talking to their group members and teachers face-to-face (Friend & Cook, 2010). This new way of collaborating in the classroom helps students who do not have high self-efficacy build more confidence in themselves and receive instant feedback from their group members. Being able to use PBL in their classrooms has motivated students to learn and apply themselves to school work according to the University of Indianapolis (2009).

Project based learning is done by students who work together to research a topic using technology to ultimately succeed in a classroom setting (Bell, 2010). According to Bell (2010), PBL is used to help students improve their researching skills while working in groups to create a hands-on project. The research provided in this article shows that students using PBL achieved better scores on standardized tests than their peers.

### Negative Aspects of PBL

The down sides to PBL include time-consuming projects and teachers having difficulty managing their classrooms with so much activity going on during a PBL project. Teachers need support in implementing PBL in their classrooms (University of Indianapolis, 2009). These supports include classroom management supports such as support during the implementation of PBL in their classrooms, since there are so many projects going on at one time.

The research on PBL appears to state that the use of PBL increases student achievement. PBL integrates important aspects of learning like communication, problem- solving with technology, and the freedom to create a project of one's choice based on a certain subject area. Clearly, the PBL teacher needs support in classrooms to get projects started; however, if they have the technology and the knowledge, they can teach their students to work independently. Students using PBL appear to benefit from their projects more than their peers who are following the standard state curriculums.

### **Methodology**

Project based learning is an interactive way for students to use projects to expand their learning. Although PBL is usually done in small groups, there are classes, much like the one at Myrtle Beach High School, that use PBL and its technology every day as a way to get students interested in what they are learning. As discussed previously, there were two questions that were researched, question one was: Is the use of PBL increasing students attendance compared to students without PBL? Question two was: Do students and teachers at MBHS perceive PBL as a positive aspect that improves their ability to learn in English Language Arts? Over the course of

this study, these questions were explored through attendance records and surveys where completed in a PBL classroom and a traditional classroom.

### Participants

At Myrtle Beach High School, there were 63 tenth grade students involved in PBL. These students used PBL in the subjects of English, Social Studies, and Math. For this study, the research and observations were focused on one English class with PBL, the treatment group, and one traditional class, the control group. Both of these groups were composed of a similar demographic measured by similar percentage of free and reduced lunches, as well as similar socioeconomic status, male to female ratio, and similar ethnic/cultural background. During the study, in order to compare these two classes, a student Description Chart will be used, Appendix A.

### Method of data collection

The first step of this study was to observe an English class at Myrtle Beach High School using PBL, and an English class not using PBL, over a thirty-three day period. In order to answer question one of this study, the next type of data that was collected was student attendance. Each day student attendance was collected in both the class with PBL and the traditional class. This is in order to see if PBL is helping provide some interest for students to come to class or school rather than skip a regular class without the use of PBL. Student attendance records were used to see if there are any patterns as to why and when students attend class. These records also showed if the students are interested enough in PBL to come to their classes. Comparisons were made to determine if students in the PBL English class attend more often or less often than the students in the control group, the traditional classroom, which does not include PBL. Attendance was useful

because it was very quantifiable; it indicates whether or not the students came to class. Although it does not tell if they are sick or had to leave school, it did show who is coming to the classes using PBL and who is not.

In order to answer question two of this study, surveys will be given to both students and teachers in PBL English and in the traditional English class, Appendix B. The surveys were given out to both types of classes and their teachers to see how their views on PBL and technology differ if at all. These surveys showed how the participants in PBL feel versus the participants of traditional classrooms. It was important to gather this information because the attitudes of the students and teachers in Myrtle Beach High School are what will guide how long and well PBL is used in schools in Horry County as well as in South Carolina in general.

### Timeline

Over the thirty-three days of this study, data collection included attendance records and survey results. Attendance records were reviewed starting the first week of school, August 2011 and continued through until October 5, 2011. Attendance was taken during an English class using PBL attendance and in an English class that is not using PBL. Surveys were completed upon acceptance of the Human Subjects Institutional Review Board application.

### Data Analysis

To analyze the data, the researcher looked for patterns in attendance in the PBL English class and the traditional English class. For question one, the attendance from the control group's (traditional) class and the attendance from the treatment group's (PBL) class was compared, Appendix C. The goal was to see if there are any patterns in the attendance records for either of

these classes. For question two, the data collected from the surveys was compared and analyzed, see Appendix D. This was done for both the treatment and control group to compare if one class prefers technology integrated into their learning more than the other.

After collecting this data the results were compared to each other. This showed any emerging patterns in the data whether or not one class prefers or feels more comfortable in a certain type of class over the other. After analyzing all of data along with the literature on PBL, it was then time to determine whether or not PBL is perceived as working at Myrtle Beach High School.

### **Findings**

The literature used for this study primarily addressed how important it is to incorporate technology and project based learning into classrooms. PBL provides students with new ways of thinking and allows them to explore different topics. Students who are struggling in general education classes appear to do better in PBL situations. Since PBL is interactive it is easier for students to understand concepts that are hard to explore in a paper, especially for those students who may have a disability. PBL has also encouraged students to become more involved in their classes and the community (Friend & Cook, 2010).

One aspect of PBL that scholars do not adequately address is whether or not PBL is enough of a motivation for students to come to class more often. Due to an increase in the use of technology in the classrooms, teachers have seen an increase in enrollment as well as success in their classrooms (Aust, Newberry, O'Brien, & Thomas, 2005). Although it is stated that students

often do better in PBL and enrollment numbers are higher, the literature has not addressed if PBL is enough for students to simply come to class each day.

**Question 1: Is the use of PBL increasing students attendance compared to students without PBL?**

One of the goals of this study is to see if this statement is true for Myrtle Beach High School. As a way to assess this, attendance was collected over a seven week period to see if there were any patterns or differences between the numbers of absences in a PBL English class versus a traditional English class. In order to see these patterns, a spread sheet has been created to break down the data collected. The data is divided into two sections: attendance for PBL English and attendance for traditional English class. From there, the data is broken into sections, the number of days school has been in session, the number of days each student has attended school, as well as the number of days each student has been absent. These numbers are then turned into percentages so it is easier to compare the PBL students to the traditional students. The goal is to see which class has a better attendance rate and whether or not the findings of this data correlate with the findings of the literature.

The following is a chart showing the average of the days absent and the average percent of attendance for both the PBL and the traditional class.

Table 1: Attendance

	# of days absent	% of attendance
PBL Average	1.721311	96.13%
Traditional Average	1.761905	94.52%

This chart showed that the PBL class has a slightly higher average attendance rate of 96.13%, versus the traditional average attendance rate of 94.52%. This higher percentage corresponds with scholars' articles and with the hypothesis of this study, that students will attend PBL classes more than students in traditional classes. Although the number of days data was collected was limited and the size of the traditional group is much smaller than that of the PBL class, the percentages make the information easier to synthesize.

**Question Two: Do students at MBHS perceive PBL as a positive aspect that improves their ability to learn English Language Arts?**

Another aspect that scholars do not focus on as much was how PBL is perceived by the students and teachers who use it. In order to assess this at Myrtle Beach High School, eighty-five anonymous surveys, Appendix B, were given out to the PBL English class and a traditional English class. Of these eighty-five surveys, eighty-four were completed, which is a 98.8% completion rate. Two of the surveys were completed by teachers in the PBL class. The one survey that was not completed was either not completed by a student in the traditional class or by the teacher in the traditional English class. Although the size of the PBL class is much bigger than the traditional class all of the data is being turned into percents to make it easier to compare the two classes to each other.

In order to compare the data collected from the surveys, another spread sheet was used to show often the students in both classes selected certain answers to each question, in other words the mode. The survey data was disaggregated by PBL class and traditional class. Although the surveys were anonymous they were numbered so that each response for every question could be

analyzed per survey. This provides the researcher with the opportunity to see how each student in both classes responded to each question and whether or not there are any patterns between the classes. These patterns in turn show how both PBL and traditional class perceive the use of project based learning and technology in their classes.

Each survey contained three components. Component number one included statements based on a rating scale about the perception of technology in class, whether the participants liked or disliked technology in their classrooms, as shown in table 1. Component two of the surveys was a selection of questions about whether or not technology is useful in class, as shown in table 2. The third component of the surveys was questions on the participants comfort level with the use of technology, as shown in table 3.

The first part of the survey included statements, which the participants were asked to select the best rating for each statement.

Table 2 – Survey: Section 1

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Being able to use technology in English class makes the class more enjoyable.	1	2	3	4	5
The technology academy at MBHS offers classes that are very different from traditional classes.	1	2	3	4	5
Using technology in class helps you to understand and expand more on the topics you are learning.	1	2	3	4	5
Technology is necessary to complete your assignments.	1	2	3	4	5



You would rather be in a traditional class over a technology academy class.	1	2	3	4	5
Teachers that use technology in their classes make learning easier.	1	2	3	4	5

The ratings to choose from were strongly disagree, disagree, neutral, agree, and strongly agree. The first statement was: "Being able to use technology in English class makes the class more enjoyable." For statement one, PBL's average rating was 4.3 and a mode of 5 (strongly agree) and the traditional class' average was 4.15 and had a mode of 5 (strongly agree). The second statement was: "The technology academy at MBHS offers classes that are very different from traditional classes." For this statement the PBL class had an average rating of 3.5 and a mode of 3(neutral), and the traditional class has an average of 3.53 and a mode of 3.

The third statement was: "Using technology in class helps you to understand and expand more on the topics you are learning." The PBL class had an average rating of 4.07 for this statement, and a mode of 5 (strongly agree). The traditional class has an average of 3.65 and a mode 4 (agree).Statement four, "Technology is necessary to complete your assignments", had an average of 3.43 for the PBL class with a mode of 4 (agree). This statement had an average of 3.69 and a mode of 3 (neutral) for the traditional class. For statement five, "You would rather be in a traditional class over a technology academy class", the PBL class had an average rating of 2.80 and a mode of 3 (neutral). The traditional class had an average of 3.15 and a mode of 5 (strongly agree). The sixth statement was "Teachers that use technology in their classes make learning easier." For this statement the PBL class had an average rating of 4.05 and a mode of 4 (agree). The traditional class had an average of 4.22 and a mode of 5 (strongly agree).

For the second component of the survey questions were posed instead of the use of statements.

Table 3 – Survey: Section 2  
 On a scale of 1-5, 5 being the most likely and 1 being the least likely.

Questions	Very Unlikely	Unlikely	Neutral	Likely	Very Likely
How likely would you be to volunteer to be in a PBL or technology academy class?	1	2	3	4	5
How likely would the use of technology help you in your classes?	1	2	3	4	5
How likely would the use of technology help you in your classes?	1	2	3	4	5

These questions were based on a rating scale, with the options of very unlikely, unlikely, neutral, likely, and very likely. The first question or Q7 on the spread sheet was: "How likely would you be to volunteer to be in a PBL or technology academy class?" The PBL class had an average answer of 2.82 and a mode of 3 (neutral). The traditional class had an average or 2.8 and a mode of 2 (unlikely). The second question in this section or Q8 was: "How likely would the use of technology help you in your classes?" The PBL class' average was 4.08 and their mode was 5 (very likely). The traditional class' average was 3.8 with a mode of 4 (likely). Inadvertently, the third question in this section of the survey, Q9, was the same as QS. The participants' answers, however, were slightly different for this question even though they had just answered it. The PBL class had an average of 3.93 and a mode of 4 (likely). The traditional class had an average of 4 and a mode of 4 (likely).

The third component of the surveys was about how comfortable the participants felt with technology.

Table 4 – Survey: Section 3  
On a scale of 1-5, 5 being the very comfortable and 1 being the very uncomfortable.

Questions	Very Uncomfortable	Uncomfortable	Neutral	Comfortable	Very Comfortable
How comfortable would you be if you were asked to be in a technology academy class?	1	2	3	4	5
How comfortable would you be if you were in classes that do not use technology?	1	2	3	4	5

The first question in this component of the survey, Q10 was: "How comfortable would you be if you were asked to be in a technology academy class?" The PBL class had an average answer of 3.56 and a mode of 4 (likely). The traditional class had an average answer of 3.2 and a mode of 4 (likely). The final question on the survey, Q11, was: "How comfortable would you be if you were in classes that do not use technology?" The PBL class' average was 2.92 and had a mode of 3 (neutral). The traditional class had an average of 3 for this question, and a mode of 3 (neutral).

**Conclusion**

In conclusion, this study found that the data supported the original thesis, that PBL will encourage students to come to class more often. The data from attendance records also showed that PBL has a higher attendance percentage rate, meaning that they are coming to class more often than the students in the traditional English class. The PBL class had an average attendance rate of 96.13% and the traditional class had an average attendance rate of 94.52%. Although the difference between these two rates is small, the data shows that the PBL students had a higher average attendance rate over all during the data collection of this study. If this study could be done again, a recommendation would be to collect data over an entire school year to see which class had a higher average attendance rate over all.

The data from the surveys showed how PBL was perceived at Myrtle Beach High School. This data showed that PBL students were more comfortable using technology in their classes and that they see the need for the use of technology in PBL classes. Based on the survey data, the PBL class felt neutral towards volunteering to be in a PBL class. The PBL class also answered that they would be very likely to use technology to them help in all of their classes. The traditional class selected the answer that they were unlikely to volunteer to be in a PBL class.

One of the most important aspects of this study is that PBL is preparing students to be twenty-first century learners and prepare them for the world outside of high school. It would be interesting to follow these students throughout high school and after high school to see if PBL has made any impact on their learning and how their perceptions on PBL have changed over the years.

This study has proven that technology is a very important aspect in the classroom for both students and teachers to be able use. Project based learning is a way for students to use technology to further their learning and develop the skills they will need to use later on in their lives. PBL integrates technology, team work, problem-solving, and critical thinking skills into the students' worlds, allowing them to learn how to use these valuable skills for the rest of their lives. As a future special education teacher, the importance of using technology in the classroom is now much more apparent. Regardless of the fact if students have disabilities or not, technology is a way to keep them motivated and increase their attendance. For students with disabilities PBL is providing them with new and exciting ways to develop and better understand topics. Technology can also help to improve the students' perceptions of their classes and school. Myrtle Beach High School has done well at integrating PBL into their students learning, ultimately providing them with new opportunities to get their work done and improve their twenty-first century skills.

References

- Andrews, D. R. (2011). Integer operations using a whiteboard. *Mathematics Teaching in the Middle School*, 16(8), 474-479.
- Aust, R., Newberry, B., O'Brien, J., & Thomas, J. (2005). Learning generation: Fostering Innovation with Tomorrow's Teachers and Technology. *Journal of Technology and Teacher Education*, 13(2), 167-195.
- Berkeley, S., & Lindstorm, J. H. (2011). Technology for the struggling reader: Free and easily accessible resources. *Teaching Exceptional Children*, 43(4), 48-55.
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the Future. *The Clearing House*, 83(2), 39-43.
- Boon, R. T., Fore III, C., & Rasheed, S. (2007). Student' attitudes and perceptions toward technology-based applications and guided note instruction in high school world history classrooms. *Reading Improvement*, 44(1), 23-31. Retrieved from Academic Search Premier.
- Friend, M., & Cook, L. (2010). *Interactions collaboration skills for school professionals*. New Jersey: Pearson Education, Inc.
- Illinois Mathematics and Science Academy. (2008). *Problem-based learning matters*. PBLNetwork. <http://www.imsa.edu/programs/pb1n/> (accessed April 1, 2011).

- Jeffs, T., Floyd, K.K., King, L., & Canter, L.L.S. (2007). Supporting mathematics instruction through universal design for learning and technology. In Bryant, D. P., Bryant, B. R., Hughes, K., & Porterfield, J.A. (2011). *Mathematics for all: Instructional strategies to assist students with learning challenges* (75-91). Olney, MD: Association for Childhood Education International.
- Kennedy, M.J., & Dechler, D. D. (2010). Literacy instruction, technology, and students with learning disabilities: Research we have, research we need. *Learning Disability Quarterly*, 33(4), 289-298. Retrieved from Academic Search Premier.
- Martin, D. (2008). The authors gallery: A meaningful integration of technology and writing. *Middle School Journal*. 13-17.
- McLeskey, J., & Waldron, N. L. (2000). *Inclusive schools in action making differences ordinary*. Alexandria: Association for Supervision and Curriculum Development.
- Mergendoller, J. R., & Thomas, J. W. (n.d.). Managing project based learning: Principles from the field.
- Murray, B., Silver-Pacuilla, H., & Helsel, F. I. (2007). Improving basic mathematics instruction: Promising technology resources for students with special needs. *Technology in Action*, 2(5). 1-8.
- Narkon, D. E., Wells, J. C., & Segal, L. S. (2011). E-word wall and interactive vocabulary instruction tool for students with learning disabilities and autism spectrum disorders. *Teaching Exceptional Children*, 43(4). 38-45.

- Runswick-Cole, K. (2008). Between a rock and a hard place: Parents' attitudes to the inclusion of children with special educational needs in mainstream and special schools. *British Journal of Special Education*, 35(3), 173-180. Retrieved from Academic Search Premier.
- Sabornie, E.J., deBettencourt L.U. (2009). *Teaching students with mild and high-incidence disabilities at the secondary level*. New Jersey: Pearson Education, Inc.
- Thomas, J.W. (2000). A review of research on PBL.  
[http://www.bobpearlman.org/BestPractices/PBL\\_Research.pdf](http://www.bobpearlman.org/BestPractices/PBL_Research.pdf) (accessed March 30, 2011).
- University of Indianapolis. (2009). Summary of research on project-based learning.
- Zascavage, V., & Winterman, K. G. (2009). What middle school educators should know about assistive technology and universal design for learning *Middle School Journal*. 46-52.



## Appendix A

### Student Descriptions

TWENTY-FIRST CENTURY LEARNING: IS PROJECT-BASED LEARNING, THE LEARNING OF THE FUTURE?

32

<b>Name</b>	<b>Age</b>	<b>Gender</b>	<b>Ethnicity</b>	<b>Grade</b>	<b>Disability</b>	<b>Accommodations</b>	<b>RIT Scores</b>	<b>Lexile</b>
Duncan	15	Male	White	10th	OHI	Seated near teacher, word processor for extened responses, small group instruction, and end of year course tests on a computer	MAP-Reading 218 6%ile, Math36%ile	1075
Kelsey	15	Male	White	10th	OHI	Preferential seating, prompts, directions repeated, and oral testing	MAP-Reading 181, Math-211	
Luis	15	Male	Hispanic	10th	SLD	Oral testing, small group instruction and extended time	MAP-Reading 205, Math 231	696
Odet	15	Female	Hispanic	10th	SLD	Oral testing, small group instruction, separate location and extended time	MAP-Reading 195, Math 213, Language 197	505
Iraceni	16	Female	Hispanic	10th	SLD	Oral testing, small group instruction, separate location and extended time	MAP-Reading 209, Math 197, Language 206	
Daquaris	15	Male	African American	10th	SLD	Extended time, small group instruction and oral testing	MAP-Math 221, Language 212	
Terrell	15	Male	African American	10th	SLD	Preferential seating, oral testing, small group instruction, and separate testing location	MAP-Reading 198, Math 199, Language 193	560

TWENTY-FIRST CENTURY LEARNING: IS PROJECT-BASED LEARNING, THE LEARNING OF THE FUTURE?

33

Tafari	15	Male	African American	10th	Autism	Small group instruction, separate testing location, oral testing, and extended time	MAP-Reading 201, Math 215, Language 210	622
James	15	Male	African American	10th	SLD	Oral testing, small group instruction, separate location and extended time		
Micah	16	Male	African American	10th	SLD	Oral testing, separate testing location, and preferential seating	MAP-Reading 205, Math 215, Language 202	
Ramon	16	Male	Hispanic	10th	SLD	None at this time, progress monitoring will be done to observe	MAP-Reading 219, Math 242, Language 223	

Appendix B

Survey

Perception of PBL Survey

Read the statements below and select the best rating for each statement.

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Being able to use technology in English class makes the class more enjoyable.	1	2	3	4	5
The technology academy at MBHS offers classes that are very different from additional classes.	1	2	3	4	5
Using technology in class helps you to understand and expand more on the topics you are learning.	1	2	3	4	5
Technology is necessary to complete your assignments.	1	2	3	4	5
You would rather be in a traditional class over a technology academy class.	1	2	3	4	5
Teachers that use technology in their classes make learning easier.	1	2	3	4	5

On a scale of 1-5, 5 being the most likely and 1 being the least likely.

Questions	Very Unlikely	Unlikely	Neutral	Likely	Very Likely
How likely would you be to volunteer to be in a PBL or technology academy class?	1	2	3	4	5
How likely would the use of technology help you in your classes?	1	2	3	4	5
How likely would the use of technology help you in your classes?	1	2	3	4	5

On a scale of 1-5, 5 being the very comfortable and 1 being the very uncomfortable.

Questions	Very Uncomfortable	Uncomfortable	Neutral	Comfortable	Very Comfortable
How comfortable would you be if you were asked to be in a technology academy class?	1	2	3	4	5
How comfortable would you be if you were in classes that do not use technology?	1	2	3	4	5

Appendix C

Attendance Data

TWENTY-FIRST CENTURY LEARNING: IS PROJECT-BASED LEARNING, THE LEARNING OF THE FUTURE?

Student Initials	# of days school is in session	# of days attended	# of days absent	% of attendance
PBL				
CB	33	32	1	96.97%
IB	33	32	1	96.97%
LR	33	32	1	96.97%
KB	33	32	1	96.97%
AC	33	32	1	96.97%
OC	33	33	0	100.00%
CH	33	31	2	93.94%
ZD	33	32	1	96.97%
CG	33	32	1	96.97%
NG	33	32	1	96.97%
IH	33	33	0	100.00%
TH	33	33	0	100.00%
JH	33	30	3	90.91%
OM	33	33	0	100.00%
PM	33	30	0	90.91%
NN	33	32	1	96.97%
JR	33	33	0	100.00%
AR	33	29	4	87.88%
SR	33	32	1	96.97%
AV	33	33	0	100.00%
DZ	33	33	0	100.00%
JB	33	31	2	93.94%
SB	33	33	0	100.00%
JB	33	31	2	93.94%
AB	33	30	3	90.91%
CB	33	31	2	93.94%
DC	33	31	2	93.94%
RG	33	32	1	96.97%
UG	33	32	1	96.97%
MG	33	33	0	100.00%
MG	33	33	0	100.00%
FH	33	31	2	93.94%
MI	33	33	0	100.00%



TWENTY-FIRST CENTURY LEARNING: IS PROJECT-BASED LEARNING, THE  
LEARNING OF THE FUTURE?

GK	33	28	5	84.85%
CL	33	33	0	100.00%
SM	33	29	4	87.88%
HM	33	27	6	81.82%
FM	33	33	0	100.00%
SP	33	30	3	90.91%
JP	33	33	0	100.00%
JP	33	28	5	84.85%
RT	33	33	0	100.00%
YV	33	32	1	96.97%
JA	33	33	0	100.00%
LB	33	30	3	90.91%
LC	33	30	3	90.91%
KC	33	32	1	96.97%
NC	33	32	1	96.97%
SC	33	32	1	96.97%
BC	33	33	0	100.00%
NG	33	32	1	96.97%
MG	33	33	0	100.00%
KG	33	32	1	96.97%
KJ	33	33	0	100.00%
TK	33	33	0	100.00%
GK	33	33	0	100.00%
BO	33	32	1	96.97%
GR	33	32	1	96.97%
DS	33	32	1	96.97%
MS	33	32	1	96.97%
MS	33	31	2	93.94%
Average			1.721311	96.13%
Traditional				
ZB	33	32	1	96.97%
AB	33	26	7	78.79%
TB	33	33	0	100.00%
MC	33	33	0	100.00%
ID	33	31	2	93.94%
TD	33	30	3	90.91%
TJ	33	32	1	96.97%
AM	33	33	0	100.00%

TWENTY-FIRST CENTURY LEARNING: IS PROJECT-BASED LEARNING, THE  
LEARNING OF THE FUTURE?

40

BP	33	33	0	100.00%
JS	33	33	0	100.00%
KB	33	33	0	100.00%
BC	33	30	3	90.91%
JD	33	28	5	84.85%
DG	33	33	0	100.00%
QH	33	33	0	100.00%
PH	33	32	1	96.97%
MM	33	33	0	100.00%
ER	33	30	3	90.91%
ZS	33	29	4	87.88%
AS	33	30	3	90.91%
AW	33	28	4	84.85%
Average			1.761905	94.52%

Appendix D

Survey Data

TWENTY-FIRST CENTURY LEARNING: IS PROJECT-BASED LEARNING, THE LEARNING OF THE FUTURE?

42

Survey #	S1	S2	S3	S4	S5	S6	Q7	Q8	Q9	Q10	Q11
1	4	3	3	2	3	4	3	4		3	3
2	5	4	5	5	5	4	3	5	5	4	2
3	4	3	4	2	2	5	3	4	4	4	4
4	5	3	5	5	3	5	3	5	5	4	2
5	5	4	4	4	2	5	4	5	5	4	2
6	5	4	4	4	1	4	4	5	5	4	2
7	4	3	3	3	4	4	1	2	2	2	5
8	5	5	3	1	3	4	2	5	5	5	5
9	5	4	5	4	2	4	3	4	4	3	4
10	5	4	4	4	2	4	5	5		5	3
11	3	4	2	3	4	4	1	3	3	2	4
12	5	5	4	3	1	5	4	4	4	4	3
13	4	4	3	5	3	4	2	4	4	3	2
14	5	4	4	4	3	4	4	4	4	5	3
15	5	3	5	4	2	4	3	4	4	4	3
16	5	3	5	5	3	5	3	4	4	3	3
17	5	4	3	3	3	3	3	4	4	4	3
18	5	3	5	5	1	5	3	5	5	5	1
19	5	5	5	5	1	4	5	5	5	5	3
20	5	1	5	2	5	5	1	3	3	1	1
21	4	4	3	2	4	3	2	3	3	3	4
22	5	4	5	4	3	4	4	5	5	3	1
23	5	3	4	3	3	5	4	5	5	4	1
24	3	4	4	2	2	4	4	5	4	4	4
25	4	4	4	3	3	3	2	3	3	3	5
26	5	5	5	2	3	4	2	5	5	4	4
27	1	1	2	2	4	1	3	1	2	1	2

TWENTY-FIRST CENTURY LEARNING: IS PROJECT-BASED LEARNING, THE LEARNING OF THE FUTURE?

43

28	4	5	5	3	2	3	3	4	4	3	3
Survey #	S1	S2	S3	S4	S5	S6	Q7	Q8	Q9	Q10	Q11
29	5	5	5	5	2	5	4	5	5	5	3
30	3	2	4	1	5	3	1	5	4	3	5
31	5	3	5	4	3	5	3	5	4	4	2
32	5	4	5	4	1	5	5	4	4	5	1
33	3	3	2	2	5	3	2	3	3	3	4
34	4	3	4	4	3	4	3	5	4	3	3
35	5	3	5	4	1	5	4	5	5	5	1
36	4	4	4	3	2	4	4	5	4	4	2
37	5	5	5	3	4	5	4	5	5	4	3
38	3	4	2	2	5	2	2	3	2	1	5
39	4	3	4	3	3	4	3	3	3	4	3
40	1	5	1	2	5	3		1	1	1	5
41	5	4	4	3	4	3	1	3	3	3	5
42	5	4	5	5	1	4	3	5	5	4	1
43	4	5	5	4	1	5	2	4	4	4	3
44	5	3	5	5	4	5	2	5	5	4	3
45	3	3	3	3	3	4	3	3	3	2	3
46	2	3	3	4	5	1	1	1	1	2	4
47	5	3	5	5	4	5	3	5	5	3	1
48	5	3	5	5	1	5	5	5	5	5	3
49	4	3	4	4	3	4	3	4	4	4	3
50	4	3	3	2	2	4	3	4	4	5	3
51	5	3	4	2	1	4	5	4	3	5	3
52	5	3	5	5	1	5	3	5	5	4	2
53	5	3	5	4	3	4	1	5	5	3	3
54	4	2	3	4	3	4	3	4	4	3	3

TWENTY-FIRST CENTURY LEARNING: IS PROJECT-BASED LEARNING, THE LEARNING OF THE FUTURE?

44

55	4	3	5	3	4	4	3	4	4	3	4
56	5	3	5	3	3	5	3	3	5	4	2
Survey #	S1	S2	S3	S4	S5	S6	Q7	Q8	Q9	Q10	Q11
57	5	5	4	4	1	4	4	5	5	4	2
Average	4.333333	3.561404	4.070175	3.438596	2.807018	4.052632	2.823529	4.087719	3.93617	3.561404	2.929825
Mode	5	3	5	4	3	4	3	5	4	4	3