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Effectively implementing project based learning in the business classroom

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Effectively implementing project based learning in the business classroom

Abstract

Far too many of our students are leaving high schools unprepared to routinely engage in these thought processes in order to sustain our innovative, economic edge in the economy. These concerns put the United States at risk for losing our competitive advantage in the marketplace. Critical thinking and problem solving skills are far too important to be ignored. This realization leads to an important question: How can project based learning be implemented effectively in order to increase student engagement, critical thinking, and understanding? For the purpose of this paper, research will be focused primarily on controlled studies; however, valuable insight can also be gained from discourse with practitioners who have successfully implemented project based learning in their classrooms.

Running Head: EFFECTIVELY IMPLEMENTING PROJECT BASED LEARNING

Effectively Implementing Project Based Learning

In the Business Education Classroom

Submitted

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Chapter One

Statement of the Problem

The personal finance students are working in collaborative groups around the room, some reading books, others researching on the computers, some compiling survey results and others busy creating their presentations. It is two days before the students present their investment plans to area bankers and Mrs. H is walking around the room asking questions, checking group progress, and challenging students to think deeper into developing their investment plan. From the outside Mrs. H's classroom looks like the students are actively engaged in their learning and the investment strategy project Mrs. H spent so many hours creating is paying off as an authentic learning experience for the students.

Now it's presentation day. The students, all dressed in business attire, are nervously setting up their visual aids as the bankers file into the classroom. Mrs. H notices a few students wiping their sweaty palms on their pants time and time again preparing for the ever so important handshake with the business professionals. Mrs. H is feeling the butterflies in her stomach too. She hopes her students are successful in their presentations and they are able to demonstrate sound investment strategies to the bankers who so willingly volunteered their time to listen to the students' presentations. Mrs. H knew the bankers' presence was very important in order to make this project more real for the students.

Presentation one begins. The students are doing well and Mrs. H is feeling pretty proud of her students and what they have prepared. This group really did a great job analyzing their investment options; Mrs. H can now take a slight sigh of relief. Mrs. H can tell the action plan this group decided to create to organize and focus their research was

beneficial in helping them stay on pace to finish their presentation on time. Mrs. H can also tell the action plan this group created helped all the group members stay truly engaged in their learning because the group was working around one central driving idea. Mrs. H is very pleased with how her role of a facilitator/coach for this project classroom was beneficial in helping this group critically analyze the content they were studying.

Now it is time for presentation two. Once again the students did a nice job delivering their plan; however, Mrs. H and the bankers can see some areas in the plan where the students were not complete in their research. Mrs. H decides this is to be expected when students are just learning and knows she will provide her students a chance to revise their investment plans to cover these holes later on. On the other hand, Mrs. H senses most of the members of this group were motivated to do well on this project in order to be prepared to present to the authentic audience (the bankers), not because they were truly vested in the project themselves. Mrs. H hopes that the students from this group are motivated to revise their plan to enhance their learning, when a second authentic audience is not looming for them to present to.

Now it's time for presentation three. After about two minutes Mrs. H and the bankers can tell this group has not put much time, critical thinking and/or effort into their presentation at all. The only reason this group appeared to be working so efficiently two days prior to the presentation was because they were scurrying to get something done in order to finish "*Mrs. H's Project.*" Mrs. H realizes that she missed the boat as a facilitator/coach with this group because she did not have incremental checkpoints for the students to share their progress on the project. Mrs. H also realizes this group may be lacking motivation to complete this project because they feel no ownership or personal

investment in the project. Mrs. H can see how a project action plan would have been beneficial for this group to complete to focus and drive their research.

Unfortunately, presentation four all too closely resembled presentation three and Mrs. H finds herself feeling shocked, dismayed, and frustrated. How did this happen? Why did this happen? Mrs. H thought hands-on activities (projects) were supposed to help increase student engagement, learning, and understanding. What was wrong with her project? Why hadn't all students responded to the project the same way? Do Mrs. H's students really understand the investing concepts she hoped they would learn from this project? Would Mrs. H have been better off delivering the investment strategies content in a more traditional lecture format? Would the students' achievement and critical thinking have been better using a different instructional approach? Would all of the students have been more actively engaged in their learning using a different instructional approach?

As our society continues to look to our educational system to help prepare competent workers for a fast paced, ever changing, global economy there is still dissatisfaction with the results our current educational practices are producing. "An overwhelming 80 percent of voters say that the kind of skills students need to learn to be prepared for the jobs of the 21st century is different from what they needed 20 years ago. The findings indicate that Americans understand that the economy has changed and that, without skills that reflect today's workforce demands, young people may face tougher challenges earning a living wage and maintaining U.S. competitiveness than previous generations did" (Partnership for the 21st Century Skills, 2007, p. 3).

What Skills Are Businesses Seeking in New Hires?

Given the urgent need to find skilled professionals, The Conference Board, Corporate Voices for Working Families, The Partnership for 21st Century Skills, and the Society for Human Resource Management recently conducted a survey, *Are They Really Ready to Work? Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce (2006)*. This survey was designed to gain a better understanding of the readiness of new entrants to the workforce. According to the survey results, deficiencies are greatest at the high school level, with 42.4 percent of employers reporting the overall preparation of high school graduates as deficient; 80.9 percent reporting deficiencies in written communications; 70.3 percent citing deficiencies in professionalism; and 69.6 percent reporting deficiencies in critical thinking.

These survey results indicate that businesses are seeking the following five skills as most important for new hires to possess as they are entering the workforce. One, they are professional; two, they work well in teams; three, they can communicate effectively; four, they are able to read and comprehend material accurately; and five, they act in an ethical and socially responsible manner (*Are They Really Ready to Work?*, 2006).

Our country's competitive advantage in the global marketplace is dependent upon the skills of our future workforce. Preparing our students to be complex thinkers and innovative problem solvers will determine the extent to which our economy is able to exploit new technology and compete in the global marketplace. According to a 2004 RAND report, *The 21st Century at Work: Forces Shaping the Future Workforce and Workplace in the United States*, knowledge workers in every industry — from nano-scientists to package deliverers — “require high-level cognitive skills for managing,

interpreting, validating, transforming, communicating, and acting on information. Valued skills include such nonroutine analytic skills as abstract reasoning, problem solving, communication, and collaboration (p. 20).” Therefore, it is critical we begin providing opportunities in our curriculum for students to participate in experiences which require these very skills.

Among the many barriers that limit high school students’ readiness for college, the Association of American Colleges & Universities (AACU) cites “limited interpretations of learning...Learning is more than the simple acquisition of discrete facts.” According to a 2005 AACU report, *Greater Expectations: A New Vision for Learning as a Nation Goes to College*, students need to be able to do more than merely recall facts in order to be successful in college and in their future careers. More importantly students need to be able to interpret facts and information and transform that knowledge to new settings, problems, and environments—thus allowing for students to use their learning in new and meaningful ways.

Continuous lifelong learning will be essential to student success in life. Fostering an environment which effectively implements project based learning in the classroom will help students be able to develop the learning and thinking skills necessary to becoming inquisitive, passionate lifelong learners. Critical 21st Century learning and thinking skills are comprised of:

- Critical-thinking and problem-solving skills
- Communication skills
- Creativity and innovation skills
- Collaboration skills

- Contextual learning skills
- Information and media literacy skills

(Results that Matter, Partnership for 21st Century Skills, 2006, p. 13).

As Mrs. H reflects on these facts she knows her attempt at trying to implement project based learning in her classroom is on the right track in helping her prepare her students to become the kind of skilled workers the 21st Century economy is demanding.

Mrs. H is aware of the need to provide instruction for her students that is more rigorous and more relevant. In addition, Mrs. H is aware of the ever increasing need for her to challenge her students to routinely use their critical thinking and problem solving skills in order to process their learning and become self-directed lifelong learners prepared to compete in our complex global economy. Henceforth, it is imperative to look critically at Mrs. H's attempt to implement project based learning in her classroom and determine what she can do differently in order to implement project based learning more effectively in her classroom. Mrs. H is also interested in increasing the level of student engagement in project based learning activities in her classroom in the future.

Statement of the Research Question

Critical thinking and problem solving are essential life, work, and educational skills needed for our students to become the future workforce ready to be successful in our competitive global economy. Unfortunately, far too many of our students are leaving high schools unprepared to routinely engage in these thought processes in order to sustain our innovative, economic edge in the economy. These concerns put the United States at risk for losing our competitive advantage in the marketplace. Critical thinking and problem solving skills are far too important to be ignored. This realization leads to an important

question: How can project based learning be implemented effectively in order to increase student engagement, critical thinking, and understanding? For the purpose of this paper, research will be focused primarily on controlled studies; however, valuable insight can also be gained from discourse with practitioners who have successfully implemented project based learning in their classrooms.

Significance of the Problem

Change is inevitable in the 21st Century and equipping students with the critical thinking and problem solving skills to embrace, foster, and prosper in this state of increasing rate of change is a necessity. "Social change feeds on itself, accelerating at an ever-increasing rate. As a consequence, one generation's shared language of allusion won't transfer to the next. Neither are the old generation's strategies for solving problems, resolving conflicts, and coping with complex moral dilemmas necessarily transferable intact to the young. In eras of rapid social change, old answers rarely fit. Adaptation to changing realities requires higher-order thinking skills" (Brady, 2008, p. 2).

Current practices in our educational system have been primarily focused on recall and both students and teachers alike have lost sight of the need for students to internalize and make flexible the rote knowledge which is being so heavily focused on. In order for knowledge to move from rote, to inflexible, and finally flexible knowledge it must be applied, questioned, and processed. "We need to accept that what we've been doing isn't the whole story-not even the main story-of educating. For centuries, the central question directed at the young has been, How much do you remember? The proper questions for this era are, What's going on here? Why? Where is it likely to take us and what should we be doing?" (Brady, 2008, p. 2).

“Students learn to think—by thinking” (Brady, 2008, p. 4); therefore, a logical step to increasing the rigor and relevance in the instruction for the students in Mrs. H’s classroom is to investigate how project based learning, when implemented effectively, can be a powerful instructional process to help increase student engagement, critical thinking, and understanding. For this purpose, this paper will focus on recommendations for implementing and monitoring project based learning in the classroom and the benefits received by both students and teachers based on this instructional process. In this paper, project based learning (PBL), will be defined as a model that organizes learning around projects. According to the definitions found in PBL handbooks for teachers, projects are complex tasks, based on challenging questions or problems, that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations (Jones, Rasmussen, & Moffitt, 1997; Thomas, Mergendoller, & Michaelson, 1999).

Limitations of this Paper

Though project based learning can be a powerful instructional process it should be noted there are many different interpretations, approaches and practices which put this process into action in the classroom; each practitioner personalizing their approach to PBL to make it effective in the context of their classroom environment. “This diversity of defining features coupled with the lack of a universally accepted model or theory of Project Based Learning has resulted in a great variety of PBL research and development activities” (Thomas, 2000, p. 3). Therefore project based learning will encompass elements of another similar instructional theory, Problem Based Learning. “Problem Based Learning, is

focused, experiential learning (minds-on, hands-on) organized around the investigation and resolution of messy, real-world problems” (ASCD, 2008). Incorporating ideas of both problem based and project based learning is common in much of the literature and since these theories are so closely related they are sometimes used synonymously.

Organization of the Paper

There is a rising concern that today’s high school graduates are not as prepared for the world of work in the 21st Century as employers want. In order to help address this concern it is important to gain a common understanding of how PBL can play a critical role in helping equip graduates with the skills they need to meet the demands of the 21st Century work. In order to do this, this paper will first look at what a true PBL experiences consists of, the benefits to effectively implementing PBL in the classroom, and explore how PBL can better prepare graduates for the uncertainty and change of the 21st Century working environment. Next, this paper will analyze the case of Mrs. H’s ineffective project and determine recommendations for ways Mrs. H can more effectively implement PBL in her classroom. Finally, this paper will offer an illustration of a high quality PBL experience in Mrs. H’s business education classroom.

Chapter Two

Overview of the Chapter

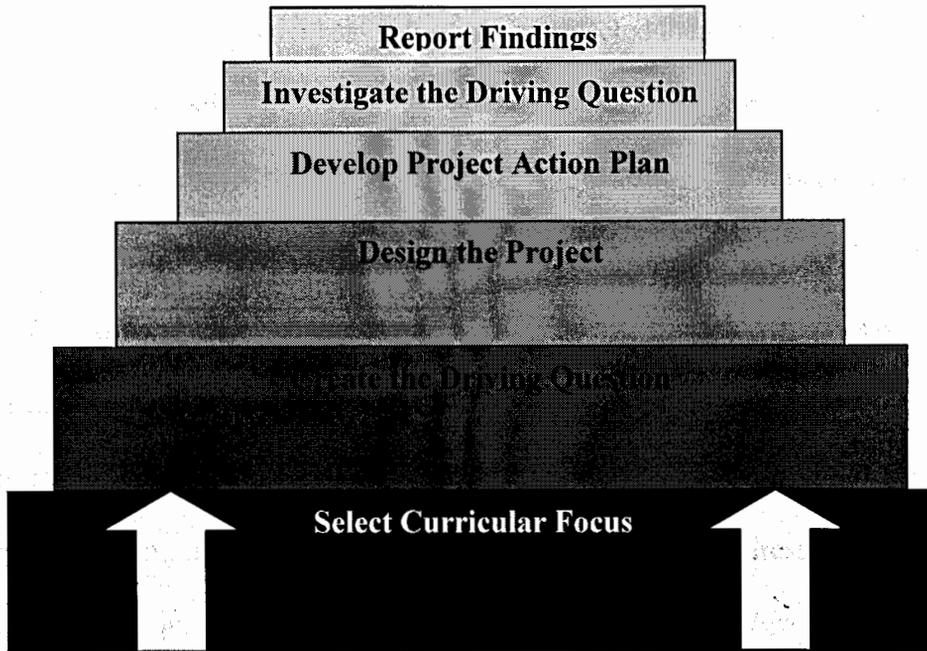
The purpose of this chapter has three parts. First, is to establish a clear definition of what project based learning (PBL) consists of. Secondly, is to discuss considerations for the teacher's role in a project based learning classroom. Lastly, is to outline the perceived benefits resulting from effectively implementing this instructional pedagogy in the classroom. A firm understanding of the foundation and theory of project based learning is essential for one to engage in discourse about the topic. Therefore, with a firm understanding of project based learning one can more objectively analyze the case of Mrs. H's ineffective project and create recommendations for improvement.

What is Project Based Learning (PBL)?

Project based learning is a student-centered instructional method in which students investigate and answer research questions that are relevant to their own lives (Dickinson & Jackson, 2008). Through students' investigations they are able to work collaboratively with classmates in order to produce tangible learning outcomes. Tangible learning outcomes (projects) are designed to demonstrate the students' knowledge and understanding of the content studied in order to answer the complex driving question of the project (Colley, 2008).

The Foundation of PBL

Figure 2,1 Foundational Building Blocks of Project Based Learning



The purpose of this figure is to provide an at a glance overview to the main steps of project based learning instruction. The base of the foundation of PBL instruction, selecting the curricular focus, is intentionally the largest block of this pyramid because it is here where the direction of PBL instruction is the most general and broad. This is one of the appealing aspects of PBL instruction because it is not an instructional strategy that is content or grade specific, but rather it serves as an instructional strategy that allows for students to build on their current knowledge to acquire and explore new knowledge. As the students move towards the top blocks of the PBL pyramid their projects will become more unique, creative, and focused on the students' quest to answer the driving question or solve a problem, henceforth the blocks become more narrow and compact.

Selecting the Curricular Focus/Developing the Driving Question

In order to begin PBL instruction, the teacher must first select the curricular focus of the project. Once the curricular focus has been selected then the teacher can move on to creating a driving question for the project. According to Dickinson and Jackson (2008), “A good driving question—central to PBL curriculum, allows students to explore areas of interest to them, while requiring them to develop core skills and knowledge.” Developing a rich, complex driving question that is relevant to students’ lives is not an easy task and can sometimes be the biggest stumbling block for teachers in effectively implementing PBL (Barron, 1998). It is important that teachers keep in mind the following ideas when developing a driving question: one, it must be broad enough to address a variety of core concepts; two, the question must be open ended and multiple days/weeks should be needed for adequate investigation of the question; and three, “answers” to driving questions should not be simple or predictable. Teachers should also keep in mind that driving questions are not etched in stone. Revision of driving questions is an ongoing process until the desired outcome is achieved (Dickinson & Jackson, 2008).

Creation of the driving question does not have to be the sole responsibility of the teacher; students can also play an integral role in generating and designing driving questions for their projects based on their own experiences and interests (Colley, 2008). In a true PBL classroom student choice is a must. Choice allows for students to take ownership in their learning and experience that learning is not something which only takes place in the classroom. Allowing for choice in project design and question creation provides students with the opportunity to take risks in their learning and apply their learning to real world problems that are important to them. Thus leading students to

understand that learning can be messy, but yet exciting, practical, and meaningful.

Students may also find not all of their question investigations will be successful; henceforth, it is important to encourage students to persevere through the challenges and learn from their challenges that not all projects and problems in life have a clearly defined “answer.” The choice and ownership fostered in a PBL classroom can lead to students becoming more invested in their learning and in turn, more actively engaged in their learning (Yamzon, 1999).

Planning the Project/Creating the Action Plan

Following the creation of the driving question, it is time to begin planning the actual project. During this stage of PBL, the end product should be a project action plan. The action plan will address the what and the how of the project (What and how are the students going to learn? What artifacts will be produced as evidence of the learning? How will the artifact be assessed/graded? Who will be the audience for the final project?) as well as a process plan for how the question will be investigated. No particular format is necessary for the creation of the action plan; however, most plans include the following elements: project title, question, project purpose, methods or procedures, list of tools, materials, technology, resources and time required, roles and responsibilities, and assessment activities (Colley, 2008).

Implementing the Project (Investigation)

Once the action plan is in place, it is time to begin implementing the project. During implementation the teacher should constantly be assessing the progress of the students on their projects and be providing students feedback on their progression. The constant and reciprocal communication between the teacher and the students will help ensure that no group is left behind in the project implementation process (Barron, 1999).

Documenting and Reporting the Findings

Following the investigation of the driving question, it is time for students to document and report their findings. During this phase of PBL students present their projects to an audience. The composition of the audience is up to the teacher's discretion; however, studies have shown that students respond more favorably when they are asked to present their projects to an authentic audience (someone related to the project's focus). For example, if the project is focused on increasing small business development in a community then an apropos audience for the project presentation would be the community's city council, chamber of commerce, economic development, etc. In addition to presenting their projects, students should also be prepared to answer questions about their project from the audience and the teacher (Colley, 2008).

After the project presentation some teachers may choose to end the project at that point and move on, other teachers may choose to ask students to reflect, evaluate, and/or put into action what they learned from their project investigation.

Considerations for the Teacher's Role in a PBL Classroom

“Algebra can be taught thoughtfully or stupidly. So can drafting, cooking, or parenting. The key is to give students opportunities to think and to make an effort to connect one subject area to other subject areas in the curriculum and to everyday life” (Noddings, 2008 p. 3). This quote truly encompasses the essences of the teacher's role in a PBL classroom. In a project based learning classroom the teacher leads his/her classroom not by simply imparting knowledge, but rather by posing questions and listening. The teacher, alongside his/her students, is in a state of inquiry and learning. The teacher is focused on both the process and the product of learning for his/her students.

The PBL teacher also assumes the role of a facilitator or coach in his/her classroom. The teacher is not the one playing the game, but rather is the one on the sidelines that provides support, guidance, and direction for the students as they sift through data and resources to investigate their questions. A teacher assuming the role of the facilitator/coach in the classroom can be a difficult change in mindset for both the teacher and the students from most traditional instructional teaching methods. Most traditional instructional teaching methods are arranged so that the students look to the teacher as the provider of knowledge and the active participant in the classroom while the students are passively soaking-up the knowledge the teacher is imparting on them. Therefore, a teacher must be aware that shifting to a PBL environment in his/her classroom may be met with some resistance by students at first. The students may not want to be in the center of the learning game, and it may take a while for their learning styles to adjust; however, the PBL teacher must remain confident and in the end the students will be grateful, improved critical thinkers (Yamzon, 1999).

Another function of the teacher in a PBL classroom is to help locate quality resources for students to consult which are relevant to their driving question for their project. The teacher should not be solely responsible for locating resources though; resource location and evaluation is a critical skill for students to practice and possess in order for them to become independent, self-sufficient lifelong learners.

The teacher in a PBL classroom is also responsible for holding students accountable for incremental steps or pieces of their projects as they progress through the learning process. This is critical for two reasons: first, the teacher needs to be sure that no student or group is being left behind in their investigations and artifact creation and second, the incremental steps serve as a formative assessment for students to monitor their own learning and progress. In addition for holding students accountable for their progress on their projects, it is also imperative that teachers set the standard high for what a quality project consists of. "It is important to point out that giving students the freedom to explore what they wish is not giving them *carte blanche*. It is up to the teacher to establish boundaries and maintain high expectations" (Wolk, 1994, p. 49). In most cases, with incremental checkpoints and meaningful, concise, and timely formative assessments, students' projects will meet the high expectations set by the teacher. The students will rise to the expectations the teacher sets for them and holds them accountable for.

Benefits of Implementing PBL

As established previously, there is an increased demand for critical thinking skills and problem solving skills in students in order for them to be successful in future employment, educational, and personal settings. "...Occupational success will require flexibility, a willingness to continue to learn, an ability to work in teams, patience and skill in problem solving, intellectual and personal honesty and a well-developed capacity to think. Success in personal life requires many of the same qualities" (Noddings, 2008, p. 5). Project based learning creates an opportunity for students to hone these skills and be engaged in collaboration and teamwork. Therefore, students can benefit greatly from experiencing the ability to think and learn in a PBL environment.

Longer and More Meaningful Retention of Knowledge

PBL instruction allows for students to grapple with the unknown of concepts and ideas and make meaning out of them for themselves. This struggle with core concepts helps students engage in deep thinking, analysis, and evaluation of the concepts they are learning. With PBL instruction students are not given the right and the wrong and are expected to memorize it; rather PBL instruction relies on the idea that students will develop their own meaning of the concepts and their own interpretation of what is right and what is wrong. In addition, PBL instruction allows for students to focus on a sustained curricular focus for an extended period of time. According to Noddings (2008) what is the point of covering a large body of content if students will soon forget it? "How can we claim to educate our students if they do not acquire the intellectual habits of mind associated with thinking?" (Noddings, 2008, p. 4). The focus of PBL instruction is not on the breadth of content coverage, but rather more on the depth of content coverage. Due to

these factors, students engaged in learning in an effective PBL environment sustain much longer and more meaningful retention of knowledge than students in a more traditional learning environment.

Opportunity For Every Student to Be Successful

“The most important rationale for learning through projects is that they serve as an outlet for every child to experience success” (Wolk, 1994, p. 44). The student choice and project personalization found in effective PBL environments are key elements in helping students from all academic levels experience success in the classroom. This individualization makes it so the students feel empowered and valued in the classroom which in turn helps to increase their self-esteem about their ability to learn. According to Wolk (1994) “success and self-esteem go hand-in-hand” (p. 45). The more confident a student feels in their ability, the more likely they are to invest themselves in their learning because they are not stifled by the fear of failure. In addition, an increase in self-esteem helps students to be more confident in their abilities to tackle the unknown and take risks in their learning. According to the AED report, the attendance rate of schools which implement any form of PBL on a wide scale basis is over 90% (as cited in Thomas, 2000, p. 10). This statistic is a testament to the value and success students experience when learning in an effective PBL environment—students want to be at school and students are eager to learn.

Prepared to Take Risks and Handle Uncertainty

A PBL environment is not an environment with a guaranteed path or predetermined series of exercises for students to complete. A PBL environment in its truest form is an environment of unknown and uncertainty. Students may be investigating a driving question which may or may not have been studied before; therefore, students and teacher alike are not sure what they may encounter as the students' investigations progress. Much like in real life adults are faced with challenges and question which contain uncertainty and unknowns. Since students have learned to work productively in this type of environment, it is found that students who are educated in a PBL environment tend to be more prepared to handle the risk and uncertainty in life better than students not educated in a PBL classroom.

According to Brady (2008) we are in an era of rapid social change and as this change continues to increase and multiply the answers and solutions of yesterday's world may no longer fit. Students will need to be able to adapt to change and thrive in an environment of uncertainty and unknowns. PBL instruction allows for students to use higher-order thinking in order to find solutions for the uncertain or unknown of our future world. Students' ability to think, problem solve, and be innovative in an era of rapid change should be the ultimate goal of our educational system and using a PBL instructional approach is a strong step towards ensuring students are equipped to do so.

Improved Critical Thinking and Reasoning Skills

PBL instruction allows for students to routinely engage in critical thinking and reasoning skills. As students have more practice honing these; skills it is highly probable they will become improved in both of these areas. "When students practice decision

making and deductive reasoning and are exposed to examples from real life, they are able to expand their skills, evaluate their options, and think critically” (Stix and Hrbek, 2006, p. 349). As the demand for critical thinking and logical reasoning continues to grow into the 21st Century, students exposed to PBL instruction will be at an advantage with their ability to effectively use these skills because they have been provided an opportunity to practice these skills.

Teachers who rely solely on traditional instructional methods are not challenging their students to look at ideas and concepts with a critical eye, but rather are expecting their students to recall someone else’s ideas as the correct state. According to Brady (2008) “Conventional textbooks are all but useless for teaching higher-order thinking skills because they represent the final conclusions of other people’s thought processes...students learn to think—by thinking” (p. 65). PBL instruction does not expect students to take the explanation of an idea at face value, but rather challenges students to dig deeper and determine whether the explanation is still relevant for the circumstances and time. “PBL uniquely addresses the calls for greater inquiry and depth, while also addressing current views of cognition and learning” (Dickinson and Jackson, 2008, p. 30). Due to these circumstances students in effective PBL environments have improved critical thinking and reasoning skills—highly coveted skills for success in the 21st Century.

Summary of the Chapter

PBL instruction offers many benefits to students when implemented effectively. However, it is very important the teacher understands how their role in a PBL classroom varies from other instructional settings. A PBL teacher is a teacher facilitator, locator of quality resources, provider of constructive feedback and holder of high expectations. In addition, it is critical the foundation of PBL is at the base of the teacher's planning and instruction as she/he embark on implementing PBL in his/her classroom. If a teacher strays from the foundation of PBL instruction it is likely an effective and meaningful PBL experience will not exist for students.

Chapter Three

Overview of the Chapter

The focus of this chapter is on how a synthesis of current literature on PBL instruction suggests a teacher should go about effectively implementing PBL in their classroom. This chapter will provide insight on how creating, designing, and implementing PBL instruction effectively is not an instant transformation process for both the students and the teacher. This chapter will also suggest strategies and tips teachers should consider when transitioning his/her instructional methodology towards PBL instruction. In addition, this chapter will discuss the key elements of successful PBL experiences as well as the typical project cycle of PBL.

How to Effectively Implement PBL

Key Elements of PBL

Doing without thinking can be a common pitfall for students when PBL is not effectively implemented in the classroom. The students can become too focused on the product of their learning and not the process of their learning; thus making it so their knowledge of the content is superficial and not meaningful (Barron et al, 1998, p. 274). Also, sometimes teachers confuse an exercise working with and applying course content to a project with a PBL experience, when in fact it is really just an exercise of subject matter application. Since PBL can easily be mischaracterized, it is critical a teacher includes the following key elements in each of their projects in order to effectively implement a PBL experience in their classroom.

The following key elements must be present in order for quality project based learning experience to exist:

- A rich, complex driving question that is relevant to students' lives
- The production of an artifact
- The students are the center of the learning
- Collaboration among students, teachers, resources, community, etc. must take place
- Accountability for incremental steps in the project
- Authentic use of technology
- Interdisciplinary and cross-disciplinary inquiry is fostered
- Extended time frame is available
- Valid and reliable performance based assessments are used (Colley, 2008)

When a teacher keeps these key elements in mind as they begin transitioning their instruction to PBL they are more likely to be successful at effectively implementing quality PBL for their students.

PBL Project Cycle

According to current literature there are not an exact number of phases or steps to follow when creating a PBL based learning experience. However, the literature does suggest that there are certain phases a project must progress through in order to produce an authentic PBL experience for students which increases their critical thinking skills, project ownership, and content understanding. Following is a recommended PBL project cycle.

Teacher Selects Curricular Focus of Project

During this phase the teacher selects a broad curricular focus based on course content which will provide for a broad area of study for the students over an extended time frame (Colley, 2008, Dickinson & Jackson, 2008; Savery & Duffy, 2001; Stix & Hrbek, 2006).

Teacher Orientates Students to the Goals and Objectives of PBL Instruction

This phase of the project cycle does not need to be repeated every time a teacher begins a new PBL experience; however, when a teacher first shifts their instructional method from a more traditional approach to PBL this phase will be critical to the project's success. The students need to be aware of the expectations of both the teacher and this style of instruction in order to be able to meet those expectations (Colley, 2008, p. 25).

Teacher, Students or Both Collectively Design the Driving Question(s)

The driving questions of a PBL experience should be broad and not contain an easy right or wrong answer. While designing the driving question for a PBL experience, the following five questions can be used to determine whether the driving question would be an appropriate focus for a project. When addressing these questions, in order for a driving

question to lead to a successful PBL experience, all of the answers to the questions must be “yes.”

1. Is our question clear?
2. Can we investigate it in the amount of time available?
3. Can we investigate it at a reasonable cost, without purchasing expensive materials?
4. Will the results of our investigations benefit others?
5. Will our question contribute new knowledge to the field?

(Colley, 2008, p. 26)

Students Take on the Role of Project Designers

During this phase of the project cycle students should have the opportunity to express what artifacts/learning outcomes they think are apropos to the project. In addition, students should be responsible for completing an action plan for how the process, procedures, and logistics of their projects will be carried out. This phase is also the point in time when the students and the teacher should determine the criteria for evaluating the projects (Colley, 2008, Dickinson & Jackson, 2008; Savery & Duffy, 2001; Stix & Hrbek, 2006).

Students Implement the Project

While participating in project implementation the students are busy investigating their driving question and accumulating the information, data, and materials necessary for the project (Colley, 2008, Dickinson & Jackson, 2008; Savery & Duffy, 2001; Stix & Hrbek, 2006).

Students Create Their Project

While formative assessment checkpoints throughout this project cycle are critical for its successful implementation, it is as this phase of the cycle when the formative assessment feedback provided to the teacher is the most critical to discuss. The formative assessment feedback will allow for the students to revise, rework, or revisit any missing links or information in their projects. It will also provide the teacher the best opportunity to check for the thoroughness of student learning and understanding. If the teacher feels the students' knowledge is superficial, the teacher will have the opportunity to prompt the students to dig deeper and think more complexly about their information. Since both the students and the teacher will be aware of any project progression concerns at this point, this should help alleviate big gaps in the students' final project artifact and the final evaluation criteria (Colley, 2008, Dickinson & Jackson, 2008; Savery & Duffy, 2001; Stix & Hrbek, 2006).

Students Report/Present Their Findings

During this phase of the project cycle students have the opportunity to showcase their findings to an audience. The medium in which students present their findings can vary according to what is the most logical and realistic for the project design. The audience for the report and/or presentation should ideally be authentic. It is also encouraged that students are a part of the discussion which plans who the audience for their projects should be. Also during this phase of the project cycle students should be expected to answer questions about their topic beyond what they have reported. This will allow for the students to show their depth of understanding of the studied content (Colley, 2008, Dickinson & Jackson, 2008; Savery & Duffy, 2001; Stix & Hrbek, 2006).

Students Reflect on their Learning Process and Assess Projects

This phase of the cycle is where students and the teacher have the opportunity to assess the project based on the evaluation criteria which was established in a previous cycle phase. During this phase the group members can also decide to take action (put their project findings into practice) if they believe it is fitting.

If each of these project phases are followed with integrity, it is highly probable the creation of an effective PBL experience will take place. However, teachers should be prepared for the fact that it takes about three project implementation cycles to work out most of the kinks in PBL (Dickinson and Jackson, 2008). Teachers should not become discouraged and should continue to revise their PBL experiences in order to make it successful. The long-term student benefits of working in a PBL environment are too great to give up on.

Summary of the Chapter

While the preceding overview of the PBL project cycle and the key elements required for successfully implementing PBL in the classroom should by no means be considered comprehensive, these recommendations advocated for in the current literature base can and should be a starting point for teachers working toward improved implementation of PBL in their classroom. A teacher looking to increase student engagement, understanding, and critical thinking skills using PBL instruction should consider following the recommended project cycle and including all the key elements of PBL outlined above. Keeping these factors in mind, teachers should take a critical look at their PBL implementation and add any missing elements, follow the project cycle, and cut any unnecessary, non-value added elements or phases.

Chapter Four

Overview of the Chapter

The previous synthesis of research defined PBL, the foundation for its implementation, steps to follow when designing a PBL unit, and the perceived benefits and outcomes of student participation in a PBL classroom. The first purpose of this chapter is to revisit the case of Mrs. H's ineffective project and analyze where she went wrong in her design and delivery. The second purpose of this chapter is to offer recommendations so Mrs. H can effectively implement a true PBL experience in her classroom which increases student engagement, critical thinking and problem solving.

Analysis of Mrs. H's Project

What has Mrs. H done well?

Upon first glance Mrs. H's project appears to contain many of the elements which are essential to effectively implementing PBL. Mrs. H has her students arranged in collaborative groupings in order to foster an environment of teamwork and improved communication skills. A definite must according to PBL literature. Mrs. H has also assumed the role of the facilitator/coach in her classroom. Mrs. H was not the one answering questions, but rather asking them. She was rotating her classroom asking students questions and prompting them to dig deeper and analyze their data more critically in order to ensure the students were not only prepared for their presentations, but also truly understood the concepts they were studying.

Based on the research, on PBL Mrs. H also did a good job bringing in an authentic audience for her students to present their project findings. Mrs. H knew her students had put forth more effort for this project than previous ones because they were going to be

presenting to people they did not know. Mrs. H also knew the students were more interested in learning the content they were studying because they did not want to appear stumped or unprepared when an audience member asked them questions related to their project.

All in all Mrs. H has the beginnings of a sound PBL experience. Where did she go wrong? Was Mrs. H's project a true learning experience for students or were they just doing it to get it done?

What roadblocks did Mrs. H encounter?

Mrs. H encountered a few large roadblocks on her journey to implementing PBL successfully. Her first road block was the fact that only one of the groups was truly engaged in their learning. The rest of Mrs. H's students were simply just completing "Mrs. H's project" in order to meet the expectations of the class, not to learn something. A second roadblock for Mrs. H was the fact that one group had virtually nothing prepared or done for their project on presentation day. Why did this happen? The students in this group appeared busy doing something, but what? A third roadblock Mrs. H encountered was that when the students were responding to the audience members' questions the groups did not appear to have much knowledge about their topic beyond what Mrs. H had outlined as the items to research on the student direction sheet. Why hadn't the students researched any further? Mrs. H knew these roadblocks were definitely obstacles which could be removed and that this project had potential to be a meaningful PBL experience for her students. In order for this to be a true PBL experience, Mrs. H will need to make some adjustments in her project design and delivery.

Recommendations for Effectively Implementing Mrs. H's PBL Experience

When analyzing what went well in Mrs. H's project and what roadblocks or obstacles she encountered in successfully implementing PBL, one can not help but notice that with a few simple adjustments in her project planning, delivery, and monitoring, Mrs. H could be well on her way to revising this project in order to effectively implement PBL in her classroom.

One of the first recommendations Mrs. H should include in her revised project is to orientate her students about the goals and objectives of PBL instruction. Mrs. H did not ever share with her students the expectations and process of PBL instruction; therefore, she left it open to student assumption. Without explicitly addressing the goals and objectives of PBL instruction with her students, there is no way Mrs. H can be certain her students understood how they were going to be assessed, what their responsibilities were, and the overall expectations of their project work (Colley, 2008). Henceforth, Mrs. H needs to be sure to make communication of her expectations the first thing she wants to do when moving her students toward PBL instruction.

Secondly, in the overview of Mrs. H's project, there is never a mention of a driving question or questions to help frame and focus the students' projects. Since a driving question is the essence of what PBL is based on, then one might infer that Mrs. H's project was nothing more than an exercise of the content the students had been studying. "PBL projects are focused on questions or problems that "drive" students to encounter (and struggle with) the central concepts and principles of a discipline" (Thomas, 2000). According to Blumenfeld et al (1991), "projects which are lacking a driving question at their center are most likely going to be projects which are also lacking in student learning"

(p. 372). Therefore, it is in Mrs. H's best interest to follow the recommended steps for implementing PBL in the classroom by first selecting her curricular topic area to be the focus of the project. Then Mrs. H can either create her own driving question for the PBL experience or she can have the option of having students brainstorm potential driving questions based on the selected curricular focus and the issues relevant in their lives. However, no matter who is the creator of the driving question, Mrs. H needs to be sure there is a driving question for students to center their investigations around. Mrs. H also needs to be sure the driving questions are broad enough that it has a variety of curricular concepts and ideas to investigate and will take an extended period of time to investigate. Petrosino (1998) conducted a study which found that students were more directed in their learning when a driving question was used to center their project around (as cited in Barron et al, 1998).

In order to address Mrs. H's concern about student engagement, ownership and critical thinking in their project, it is recommended that Mrs. H allow her students more choice in designing and sharing their projects. According to Yamzon (1999), outcomes of PBL should not be set in stone from the beginning. The students will become more vested in the project if they have the freedom to determine the artifacts of their learning outcomes as they journey down their investigation path. Student driven learning outcomes will allow the students to customize their projects and the presentation of their projects based on the information and resources they were able to accumulate in their investigation of their driving questions. Yamzon (1999) also indicates that students' achievement and ownership in their project will increase if they are interested in what they are learning about. Henceforth, Mrs. H should not only consider giving her students a choice in

selecting and designing their learning outcome artifacts, but also in creating and designing the driving questions which will frame their projects. If Mrs. H allows for this additional student choice and voice in the design of their projects, she should see an increase in both student engagement and ownership in their projects. In turn, if Mrs. H's students are more invested in their projects, it is more likely that the students will be engaged in more critical thinking and analysis of the information they research. This should lead to increased student understanding of what they are researching because the students are interested in what they are investigating and are more naturally curious about how to answer the driving question(s) framing their project.

In the original overview of Mrs. H's projects, there was never any mention of the students referring to their project action plan as a guide in creating, investigating, and assessing their projects. Due to the fact there was never a mention of an action plan, it can be inferred that students were not asked to develop an action plan for their projects. With the absence of an action plan, it can be very difficult for students to stay focused on their projects and know who is responsible for what duties and tasks in order to thoroughly investigate and understand the data they are using to answer their driving question (Colley, 2008). The use of an action plan is also an effective tool for both the teacher and the students to be aware of the project expectations as they progress through the PBL experience. Therefore, it is strongly recommended that Mrs. H implement the use of action plans as a reference tool for her and her students as they progress through their PBL experience. In addition, it is critical Mrs. H has her students be responsible for creating the action plan outlining their project processes and procedures in order for students to feel ownership in their project. The students can refer to the action plan as a guide when

working on their projects. The more choice and flexibility Mrs. H allows her students in the creation of their project action plan, the more likely the students are to embrace the project and their learning (Yamzon, 1999).

In order to address Mrs. H's concern about student unpreparedness when presenting their projects and/or students rushing at the last minute to complete their projects just for the sake of completion it is recommended that Mrs. H set incremental check points to assess her students' progress throughout their project investigations. It is critical Mrs. H does not let her students' focus of their project become the "doing" of the project, rather than "doing with understanding" (Barron, 1998, p. 274). With incremental project check points in place, Mrs. H will be able to use that as formative assessment of her students' learning, progress, and understanding. Having various formative assessments available to monitor student learning, Mrs. H will be able to provide valuable feedback to her students about their project progression. Mrs. H will also be able to address concerns with individual students, groups, or the whole class based on the information she receives in the formative assessment checkpoints. With the use of incremental formative assessment checkpoints, Mrs. H will be able to more effectively monitor her students' progress and understanding, therefore, helping to reduce the number of students who are unprepared or not learning/understanding while they are working on completing their project.

Lastly, Mrs. H should keep in mind that projects should resemble activities and situations from the "real world" as much as possible. Thomas (2000) suggests that PBL projects "should embody characteristics that give them a feeling of authenticity to students." It is imperative that the projects are realistic, not school-like. The more authentic

a project feels to students, the more value they will perceive in the project because the students can see its value beyond their classroom walls. Mrs. H was right on track with PBL by inviting an authentic audience of bankers to listen to and critique her students' investment plans; however, Mrs. H could have easily taken this project to a more authentic level by having students collaborate with the bankers throughout their investigations. In addition, Mrs. H could have solicited community members looking for some investment advice to provide a profile for students to use to create a personal investment plan for—thus making the students' projects more closely resemble what a financial advisor's role would consist of in the real-world.

If Mrs. H follows these recommendations, she should be well on her way to creating an effective PBL experience for her students. By participating in this experience and other PBL experiences in her classes, Mrs. H's students will become better critical thinkers, more engaged in their learning, and develop a deeper understanding of the topics they are studying.

Summary of the Chapter

While the preceding recommendations are by no means comprehensive, these six recommendations as advocated in the current literature base can and should be a starting point for Mrs. H working toward effectively implementing PBL instruction in her classroom.

A teacher looking to effectively implement PBL instruction in his/her classroom should consider the following recommendations prior to embarking on his/her first quest with PBL instruction in the classroom.

- Explicitly discussing PBL expectations with students prior to moving towards PBL instruction in his/her classroom
- Providing student choice and voice in the creation, design, and assessment of their PBL experience and artifacts
- Creating a driving question to center student PBL investigations around
- Making the PBL experience as authentic as possible
- Setting incremental formative assessment checkpoints throughout the progression of the PBL experience to monitor student learning and understanding

As teachers analyze their own implementation of PBL, they should add missing elements, make time for the missing elements, and eliminate instructional methods which are not supported by current research.

Chapter Five

Overview of the Chapter

It is important to be able to see what project based learning looks like in the classroom in order to truly appreciate the added value and enrichment it brings to student learning. The purpose of this chapter is to use the recommendations provided previously to enhance Mrs. H's project. This chapter will provide an illustration of how those recommendations can be used together to create the effective implementation of a project based learning experience in her classroom. Following is a sequence of events Mrs. H followed in effectively implementing PBL in her classroom.

Putting Together all of the Pieces: A Classroom Application of Effective PBL

Instruction

Context

Mrs. H is striving to successfully implement a PBL experience in her junior level Personal Finance course at a small, suburban school in the Midwest. While Mrs. H has had students involved in project work before, she has always felt a disparity between her expectations and what students accomplished. Mrs. H is concerned her students are not truly engaged in their learning and are not using their critical thinking skills to create quality learning outcomes in the projects she has had them complete previously.

Step 1

The first thing Mrs. H needs to do to begin creating her PBL experience is to determine the curricular focus of her project. When studying savings and investing and its effects on the economy, the students in Mrs. H's class became particularly interested in how someone goes about planning their finances for retirement. Realizing the complexity of this very issue Mrs. H decided to make retirement planning the curricular focus of the project.

Step 2

Next, Mrs. H needs to clearly articulate to her students the goals, objectives, and expectations of PBL instruction. Even though Mrs. H has had her students engaged in project work on previous occasions, she has never taken the time to share with her students the expectations and changes in instruction that will take place as a result of her shift to PBL instruction. Mrs. H needs to clarify for the students that it is expected each student becomes vested in their driving question and actively participates in the investigation of their driving question. Mrs. H also has to communicate to her students that the journey to finding the answers of their driving questions is not always easy or quick, and is not always the most valuable learning aspect of PBL instruction. Mrs. H wants her students to be aware that the goal of PBL is not for students to simply acquire information, but rather to be critical thinkers, analyzers, and consumers of information. The learning process in PBL instruction should lead students to applying the information/knowledge they gain to help them define the driving question. Lastly, Mrs. H needs to explain to her students that the outcome of their projects should be as authentic as possible. By communicating this

information to the students, they will be better equipped to meet or exceed Mrs. H's expectations because they are finally aware of them.

Step 3

Now it is time for Mrs. H to put her students in the driver's seat—something she has failed to do in the past. Mrs. H is ready for her students to begin to develop driving questions about the curricular focus: retirement planning. During this step the students are brainstorming questions related to retirement planning that are relevant in their own lives. Some example driving questions Mrs. H's students created are: What investing methods are most beneficial for retirement planning? How do people plan for an unknown needed amount of money? How does an individual's poor retirement planning affect others? How can I be sure I have saved enough money to retire comfortably and maintain the standard of living I am used to?

Step 4

During this step Mrs. H once again puts her students in the driver's seat. Here she is having the students work collaboratively to develop their project and project action plan. Previously Mrs. H took on all the responsibility for planning her students' projects. She determined the artifacts they would produce and how the students would report their findings—Mrs. H never let her students have a voice in this process. This was one of the reasons Mrs. H felt as though her students were only completing the project to get it done, not because they had a sense of ownership in it. Mrs. H can see the excitement in her students' eyes as she is letting them take the lead in developing their projects. During this step Mrs. H has also provided each team with an action plan to help them organize the process and procedure of their project work. A copy of Mrs. H's newly developed project

action plan is included in Appendix A. Mrs. H is very excited about using action plans to help her and her students monitor their project progress. For this particular project, Mrs. H's students determine it is most logical and realistic for them to create retirement plans as the artifacts of their learning.

Step 5

At this point in Mrs. H's classroom you can see her students busy implementing their projects. Students are gathering and reviewing various resources and are engaged in professional conversations with area bankers and financial advisors in order to help them create a realistic retirement savings plan. Unlike previous projects, during this step of Mrs. H's implementation of PBL, she is very focused on receiving and giving constructive feedback to students on their project progress based on the formative assessments Mrs. H has created. One tool Mrs. H has developed as a continuous formative assessment for her students is a learning log. Each day at the end of project work time, Mrs. H allows 5-7 minutes for her students to record their observations, new questions, and areas for further investigation in their learning logs. Each day Mrs. H is able to see how each individual student is progressing through their learning as they are working towards their final project. Mrs. H found the learning logs to be a valuable tool for both her and her students.

Step 6

Now it is time for Mrs. H's students to begin creating their projects: individual retirement plans. At this point Mrs. H's students are using the materials and information they have gathered and evaluated to create their projects. Students are using Microsoft Word to explain the investing decisions they made for their retirement plans and students are using Microsoft Excel to document and calculate their projected rate of return on their

various investments. Mrs. H is noticing how all of her students seemed very focused and engaged while they are assembling their projects. She does not notice students panicking or scurrying to finish their work—a refreshing observation. This leads Mrs. H to believe her students are all on track to deliver their project findings in a successful manner.

Step 7

It is presentation time. Mrs. H's students helped her determine that a panel of bankers and financial advisors would serve as a great authentic audience for the presentation of their projects. The students also helped Mrs. H determine they would like a different panel of bankers and financial advisors to serve as their audience than the ones they used as consultants while creating their projects. The students felt they would receive more objective feedback about their investment plans from professionals who were not already invested in their projects. Mrs. H was shocked and proud of this mature thinking by her students. Mrs. H can already tell the difference in attitude and mindset of students as a result of this PBL experience.

It's presentation day. The students, all dressed in business attire, are confidently setting up their visual aids as the bankers file into the classroom. Mrs. H notices a few students wiping their sweaty palms on their pants time and time again preparing for the ever so important handshake with the business professionals. Mrs. H is feeling the butterflies in her stomach as she hopes her students are successful in their presentations and they are able to demonstrate sound investment strategies to the bankers who so willingly volunteered their time to listen to the students' presentations in order to make this project more real for them.

Presentation one begins. The students are doing outstanding and Mrs. H is feeling pretty proud of her students and what they have prepared. This group really did a great job analyzing their investment options; Mrs. H can now take a slight sigh of relief. Now it is time for presentation two. This group delivers the best presentation Mrs. H has ever had a student group do. Mrs. H was especially proud of the way the students did not falter when the audience members asked some pretty challenging questions of them. Presentation three is now underway. Once again Mrs. H is impressed at the level of student engagement and critical thinking that went in to the creation and delivery of this project. The students in this group were able to analyze many different income scenarios for themselves and develop a sound retirement plan based off of each of those scenarios. Presentation four was not a disappointment either. The students in this group demonstrated the same level of high engagement and critical thinking as the students in the other groups. Mrs. H finds herself feeling pleased, excited, and energized. Mrs. H feels as though the recommendations she was provided in order to help her effectively implement a highly engaging PBL experience in her classroom have really paid off. Mrs. H can not wait to use this process again in creating other PBL experiences for her students.

Summary of the Chapter

The journey with Mrs. H and her high school personal finance class illustrates how each of the recommendations, key elements, and project phases of PBL can work together to create an engaging learning experience for students. Although Mrs. H is by no means perfect at implementing PBL, she is an example of a reflective practitioner who is using the current literature on PBL to inform her practice and help her implement this sound instructional practice more effectively in her classroom.

Conclusion

Few would argue that creating an engaging learning environment where students experience ownership in their learning and are able to develop their critical thinking skills is anything less than desirable. PBL is an instructional method in which students learn to work together as a team, collaborate, and grapple with subject matter to gain a deep understanding of the concepts. It has been observed that students participating in well designed and implemented projects are able to learn concepts more deeply, apply their knowledge in real life situations, and are motivational for all styles and levels of learners. Teachers also benefit from PBL instruction by watching their students engage in and produce high quality, thoughtful work (Tretten and Zachariou 1995; Wurdinger et al. 2007).

By providing this high quality instructional experience students will be better equipped to meet the demands of a highly competitive, ever-changing, global society and work force. In today's society, one has an infinite amount of information available to them at the touch of a button. Therefore, students no longer need to memorize information, but rather need to learn how to be critical consumers of information. We can no longer expect students to sit and get in the classroom. In order for students to become the critical consumers of information, they need to be for success in the 21st Century, it is imperative for educators to give students the tools and skills to be successful in life and the workforce. An instructional approach like project based learning is best suited to educate students to be the critical thinkers the workforce of the 21st century demands.

According to Brady (2008),

“We need to accept that what we’ve been doing isn’t the whole story—not even the main story—of educating. For centuries, the central question directed at the young has been, How much do you remember? The proper questions for this era are, What’s going on here? Where is it likely to take us and what should we be doing about it?” (p. 2).

Keeping the need for a shift in teachers’ instructional strategies to a more authentic learning opportunity is one way students’ thinking can be moved from believing school is a place to recall what they remember, to having students engaged in intricate investigations of core concepts.

The complex nature of implementing PBL makes it no simple task. By using the recommendations previously outlined, educators are better able to incorporate this highly effective instructional approach in the classroom. Evidence suggests that when implemented correctly PBL will increase student engagement and ownership in their learning, thus improving their competency in critical thinking and reasoning skills—the goal of 21st Century learning.

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