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ABSTRACT
                This ethnographic study was designed to gain a better
understanding of the effects of student choice in Project-Based Learning
(PBL) on achievement. Data for the study came from personal interviews with
10 predominantly female teachers who were currently involved in PBL with
their students. Each teacher had at least 2 years of teaching experience, and
five of the teachers were PBL coordinators at their respective schools. The
interviews consisted of five open-ended questions related to: their
perceptions of student learning in PBL environments; the role they took with
students engaged in PBL; what they did with students who were unengaged with
the project; how student choice played a part in PBL; and the relationship
between student choice and achievement. Results indicated that PBL varied
depending on each teacher's personal style of teaching, the needs and
interests of the students, the available resources, the physical environment
of the school and its surroundings, and the degree to which the school
community was invested in PBL. The study concluded that learning could be
greatly enhanced by incorporating student choice through PBL. (Contains 27
references.) (SM)

Running Head: Project-Based Learning

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An Examination of the

Relationship Between Student Choice in

Project-Based Learning and Achievement

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ABSTRACT

If it is true that control over one's learning is a critical factor in academic performance, then students who are granted that responsibility through participation in Project-Based Learning (PBL) will achieve higher grades and retain information longer than students having less control over their learning. The purpose of this ethnographic study is to gain a better understanding of the effects that student choice in PBL has on achievement. The literature shows that PBL results in increased critical thinking, problem solving, and interpersonal skills; that learning should not be limited to the classroom; that the more choice is involved in learning, the more motivation a student will have to learn; and that risk-taking and real-world experiences are a meaningful part of learning. The data for this ethnographic study was collected by means of personal interviews with ten teachers that are currently involved in PBL with their students. From the teachers' responses in this study, it was found that PBL is synonymous with student choice and that the more children are invested in their learning, the higher their achievement. The data gathered from the sample of teachers suggests a positive relationship between student choice in PBL and academic achievement.

An Examination of the

Relationship Between Student Choice in

Project-Based Learning and Achievement

INTRODUCTION

The students are spending an hour of their afternoon exploring the creek. One student runs up to the teacher, shows her all the trash she has collected, and says, "I can't believe how much trash we've found. Do people realize that it's going into our creek? Isn't it hurting the frogs and water skeeters? What can we do about this?" While discussing their explorations and discoveries back in the classroom, these questions are posed by the same student as well as by a few others. As students excitedly voice their ideas about what can be done to help the creek, the teacher records them on the board.

A project has begun that has emerged out of the children's concerns and interests and that can take the path that children choose. The project will engage them in a real-world problem and may encompass several, if not all subjects. In this approach to teaching, the teacher teaches by asking questions, not by pouring answers into students.

STATEMENT OF THE PROBLEM

If it is true that control over one's learning is a critical factor in academic performance, then students who are granted that responsibility through participation in Project-Based Learning (PBL) will achieve higher grades and retain information longer than students having less control over their learning.

PBL is a process approach to learning in which students and teachers develop and apply skills and new understandings learned through active involvement in complex real-world projects. PBL takes into account students' innate quest to learn, capacity to do meaningful work, and need to be taken seriously. While curricular outcomes may be identifiable and predictable initially, the outcomes of the process students engage in are not. PBL demands that students learn to draw from, manage, and allocate resources from many disciplines in order to solve problems.

RATIONALE

John Dewey, a prominent progressive educator of the early 1900's, put forth that, "The undemocratic suppression of the individuality of the teacher goes naturally with the improper restriction of the intelligence of the mind of the child" (Kilpatrick, 1924, p. 173). Tanner (1997) reported that

according to Dewey, school subjects should be looked upon as natural, not artificial. In other words, the curriculum should come out of the interests and questions of the students and would naturally encompass one or several disciplines as real life does, as opposed to the artificial division into separate subjects. Dewey favored a developmental curriculum as opposed to the "traditional view of school subjects as a set of facts and principles mastered through effort rather than interest" (Tanner, 1997, p. 20). He recognized that children are innately active, that they possess a strong desire to investigate and create, and that these desires are an invaluable resource in learning. According to Tanner (1997), Dewey's vision of a good school was one based on community, not competition between students:

> The school should lead children to an understanding of social
> relationships ranging from those in their experience to the ideas and
> beliefs of their wider community (society and world). It should help
> the child to take control of and direct his own power to accomplish
> ethical and desirable social goals. (p. 50)

Dewey wanted schools to teach students how to be adaptable to change as well as to be able to guide and influence change in the larger society.

Kilpatrick (1925, 1933) also saw interest as the basis of effort. Schools should encourage students to pursue the development of active

individual interests and provide resources necessary for the furthering of those interests. Students' interests can be used to guide them towards a "greater social effectiveness" (Kilpatrick, 1933, p. 191) as students are moved to see how the control over the knowledge that they have acquired relates to the big picture. Kilpatrick (1924) puts the issue of control into perspective when he quotes Berkson:

> Coercion is the antithesis of everything democratic; it imposes an external will upon the subject; it acts always by limiting the alternative possibilities; it leaves no room for the development of that feeling of responsibility which is the *sine qua non* of a moral life. Democracy exists in any situation to the extent that force is unnecessary. (p. 178)

In Huffman, Vernoy, and Vernoy (1994), the psychological "locus of control" theory of Rotter holds that people who have an internal locus of control believe that they have significant power over the events and outcomes in their lives. In contrast, people who have an external locus of control believe that their fate is determined by the environment or chance, not by themselves. Thus, according to Huffman et al., when people have an internal locus of control, they are much more capable of dealing with events and stress in their lives. It then follows that giving students control over

their own learning will help them to be better able to cope with the changes

and decisions they will encounter throughout their lifetime.

BACKGROUND AND NEED

As our society moves into the technological age of the 21st century,

the need for adaptability, critical thought, and reasoning increases

dramatically. People can be taught these essential skills and learn to apply

them at an early age. The project approach to learning helps to bridge the

gap between acquiring knowledge and actively utilizing that knowledge in real

world experiences.

Katz (1989) states that the main premise behind including project

work in the curriculum is to enhance "children's intellectual development by

engaging their minds" (p. 2). In this case, mind refers to knowledge and

skills, as well as to emotional, moral, and aesthetic capabilities. Katz defines

a project as "an in-depth study of a particular topic that one or more

children undertake" (p. 2). The project approach places an emphasis back on

learning that is personally meaningful to the students and on children as

active participants in their learning process. Silberman, as cited in Katz

(1989), says that when students are able to choose what they want to learn

about, they will hold a greater interest for that subject than one that has been chosen for them.

Katz (1989) and Dewey (Tanner, 1997) discussed the importance of the combination of a vertical and horizontal curriculum. A vertical curriculum would be one in which students learn skills sequentially to prepare them for the next level of skills to be acquired. In a horizontal curriculum, students apply skills in order to solve problems across the curriculum both inside and outside the classroom. In other words, Katz holds that project work should not replace traditional instruction, but that project work should complement systematic instruction and help children master emerging skills. This balance will also help children to see that school does not have to be kept completely separate from their life outside of school and that all of their experiences are real and significant.

Katz (1989) summed up the findings of the research conducted on the long-term effects of different kinds of early childhood curricula: "The curriculum should provide interaction, active rather than passive activities, and ample opportunity to initiate and be engaged in interesting activities" (Katz, 1989, p. 47). This research study further explores PBL as a vehicle for active, engaging learning.

REVIEW OF THE LITERATURE

Much of the research found on PBL was based on qualitative studies and consistently found positive effects on student learning and achievement. Researchers continue to explore the long range benefits of PBL in the classroom.

Student Benefits of PBL

Through an example of Environmental Project-Based Learning, Rogers (1996) found that students developed cooperation, communication, and organizational skills; learned that most real-life problems are complex; learned to respect and care for the environment as well as their role within it; and came away feeling valued, empowered, and an important part of their community. From experiencing many projects with his students at the 5th grade level, Wolk (1994) observed that the children encouraged each other to investigate ideas and take on challenging projects. Cone (1993) noted that by asking her senior English class what they wanted to do, the result was more in-depth and honest discussions took place about a serious piece of literature such as Malcolm X. They had embraced their choice and taken on the responsibility to learn.

Graumann (1993) points out that students are able to exercise their creativity, polish their verbal skills, and master technology skills including word processing and computer graphics. One principal said of the effects of expeditionary learning, "... students have become more motivated and more interested in the insights of their peers" (as cited in Richardson, 1994, p. 28). In a kindergarten through fifth grade performance standard, the Superintendent's Challenge Initiative (1995) expected that along with developing personal skills, "Students will exhibit self-confidence, honesty, perseverance, self-discipline, and personal hygiene" (p. AL-4). Lastly, the assessors of PBL in Tinkertech Schools, Tretten and Zachariou (1997) reported that, "Through PBL, students are learning and further developing: (1) Knowledge and Skills, (2) Critical Thinking and Problem Solving, (3) Self-Worth and Personal Empowerment, (4) Personal and Social Responsibility, and (5) Cooperation and Collaboration" (p. iv).

Environment

Wolk (1994) agrees with Dewey and Kilpatrick that learning does not need to be confined to inside the classroom nor the boundaries of the school campus. His students' spontaneous and rich learning environment extended to interactions with the world. Abramson, Robinson, and Ankenman (1995)

report that teachers following the Reggio Emilia Approach see the environment as not only being a place where learning occurs, but also as "content for study and exploration" (p. 198).

LeeKeenan and Nimmo (1993) reflect on how the project approach as implemented in Reggio Emilia, Italy, inspired new possibilities in their Laboratory School:

> Through documentation, reflection, repetition, and revision, children are guided into deeper experiences. The project approach is based on an integrated model, tying children's experiences together, building connections and relationships within the child's world that helps them make sense of their environment. (p. 253)

This approach begins with close observations of the children's questions and interests. Project subjects arise from these and are transformed into authentic learning experiences.

Student Choice and Motivation

Kohn (1993) explains that student burnout, seen in the classroom as apathy or acting out, occurs because students have little voice in their schoolwork and the happenings of their school day. He further points out that if teachers want students to be accountable for their own behavior,

they need to give students the responsibility to do so, and lots of it. "The way a child learns how to make decisions is by making decisions, not by following directions" (Kohn, 1993, p. 11). Brooks and Brooks (1993) also make a case for the need for constructivist classrooms:

> Because we learn by developing new understandings of concepts and principles in the world around us, teachers need to "invite students to experience the world's richness, empower them to ask their own questions and seek their own answers, and challenge them to understand the world's complexities. (p. 5).

This constructivist approach to learning validates students' perspectives and supports them in following courses that are individually plotted. A larger emphasis should be placed on the construction and transformation of new knowledge as opposed to the mastery of traditionally accepted standards.

Temple and Rodero (1995) summarize the educational philosophy of Celestin Freinet, whom he calls "the French Dewey", as active learning in a democratic setting. Freinet suggested that in the implementation of curriculum requirements, the children be allowed to choose the order of, the format of, and the pace at which to study the topics. "Give them the

freedom of choice, and their work will take on a new meaning" (Temple & Rodero, 1995, p. 166).

Blumenfeld, Soloway, Marx, Krajcik, Guzdial, and Palincsar (1991) emphasize that in order for students to learn from their own problem-solving approaches, the outcomes of PBL should not be fixed from the outset. The freedom of directing their own paths is essential to their construction of knowledge. Chard (1998a) says that children achieve at a higher level when they are interested in what they are learning. Chard (1998b) also points out that it is helpful for children to learn about the implications of making mistakes or inappropriate choices. By experiencing being both successful and unsuccessful in school, children will be better prepared for and more confident in making decisions and taking risks outside of school.

Contextualized Learning Through Experience

Experiential learning and the theories behind it are very closely related to PBL. For instance, in theoretical psychology, the Yerkes-Dodson Law (Drebing et. al., 1995) holds that as anxiety increases, learning increases. When too high a level of anxiety is reached, the learning curve starts to go back down. Before that level is reached, however, a moderate

level of anxiety makes people "more ready to try out new behaviors and methods of problem-solving" (p. 358). While Barth (1990) also concludes that risk-taking is strongly correlated with learning, Freinet seeks to make the link between school knowledge and real-world experience, "by bringing the world into the school and taking the school out into the world" (Temple & Rodero, 1995, p. 164).

The research stresses the significance of experience in both academic and life endeavors. The Superintendent's Challenge Initiative (1995) defines applied learning as "a process of integrating one or more subject matter content areas (disciplines) under study with authentic (personal, home, career, community, society) learning experiences" (p. AL-1). Coleman (1995) points out that as our society becomes increasingly media-dependent for information, "... from books to newspapers to television," obtaining that information by means of experience is becoming rare. Children are thus having less of an experiential base on which to build basic skills and knowledge. Some of the central principles and features of expeditionary learning that Richardson (1994) lists are: self-discovery, responsibility for learning, real-life challenges, success and failure, the natural world, diversity and inclusivity, solitude and reflection, cooperative and individual work,

student-centered approach, elimination of tracking, use of performance and portfolio assessments, and intellectual and character development.

Heath (1995), who involves experiential learning in every course he teaches from nursery schools to alternative schools, conducted a study examining what it means to be an effective adult. Of the men he had studied, he found that their happiness was not related to achievement, as measured by grades, that they had experienced in school. The happier person was the one who had been psychologically mature as a youth and whose growth and maturation had continued to grow considerably after having graduated from college. Heath found the qualities of a highly effective adult included, "ability to anticipate, imaginative-ness, empathy, tolerance, interpersonal sensitivity, persistence, ability to schedule and plan, and so on" (p. 163). Heath concluded that the most distinctive quality of highly competent and productive people was adaptability.

In Horwood (1995), a high school student's self-evaluative statement describes simply the essence of experiential learning:

> In this program you don't learn from one teacher and one textbook, you learn from everything. You learn from your experience; you learn from observing and asking questions; you learn from everything you do and people you meet. This is what life's about; You make friends, you

work together, you learn. You go out into the world and you . . . live

life. (p. iv)

Summary

The literature finds that the benefits of PBL extend beyond mastery

of content knowledge to encompass increased self-esteem and

empowerment, as well as critical thinking, problem solving, and interpersonal

skills. Second, learning should not be limited to inside the classroom walls.

Third, research also shows that the more choice that is involved in learning,

the more motivation a student will have to learn. Finally, researchers stress

the importance of risk-taking and linking the real-world experiences of

children to what is learned in school.

METHOD

Ethnographic data was collected by means of personal interviews with

ten different teachers that are involved in PBL with their students. The five

open-ended, in-depth questions asked of them were aimed toward gaining a

better understanding of the effects that student choice through PBL has on

student achievement. Common trends in their responses will be presented

that support this paper's theory on the benefits of PBL. This study adhered

to the ethical principles of the American Psychological Association Manual
(1994).

PROCEDURE

The teachers who were interviewed for this study were first given an
oral explanation of the study and asked if they would agree to serve as a
research subject. The teachers had an opportunity to ask questions. The
teachers signed and dated a consent form that stated that they are aware
of and understand the project's procedures, risks, and benefits; that
confidentiality will be protected; and that participation is voluntary.

Ten teachers were interviewed at their convenience during the period
of December 4, 1998 through February 8, 1999. Of the ten teachers
interviewed, nine are females and one is male. Each teacher has at least two
years of teaching experience, while five of the teachers are PBL
Coordinators at their respective schools. The teachers work at 4 different
schools in two different school districts in the North Bay Area.

The interviews were recorded using a cassette recorder in order to
insure an accurate record of responses. The interviews took no longer than
one hour in duration and consisted of five open-ended questions. The
questions that were asked of the teachers interviewed are the following:

- What are your perceptions of student learning in a PBL environment as compared to other learning environments?

- What role do you take on with the students when they are engaged in PBL?

- What do you do with a child who is unengaged with the project? What other challenges have you experienced with PBL?

- How has student choice played a part in PBL? What do you do when students don't make good choices?

- Do you see a relationship between student choice and achievement?

DATA ANALYSIS

The following table outlines the most common trends in the responses of the PBL teachers interviewed.

PBL Teacher Responses

Questions	Common Responses
What are your perceptions of student learning in a PBL environment as compared to other learning environments?	♦ Learning in a PBL environment is more permanent, meaningful, engaging, and democratic
What role do you take on with the students when they are engaged in PBL?	♦ Facilitator ♦ Document student learning ♦ Teach the basic background information and other skills that arise during the PBL process
What do you do with a child who is unengaged with the project? What other challenges have you experienced with PBL?	♦ Determine the cause of the unengagement ♦ Help the child find their interests and strengths ♦ Time constraints
How has student choice played a part in PBL? What do you do when students don't make good choices?	♦ PBL is student choice ♦ Allow children to make mistakes and learn from them
Do you see a relationship between student choice and achievement?	♦ Yes. Definitely. ♦ The more invested they are, the higher the achievement

<u>What are your perceptions of student learning in a PBL environment as</u>

<u>compared to other learning environments?</u>

The teachers described the learning in a PBL environment as more

meaningful, relevant, engaging, permanent, and energetic than compared to

other environments in which learning is more rote and not as stimulating. The

teachers also described the PBL environment as safe, democratic, and child

driven. One teacher portrayed it in this way:

> In a PBL environment, student's inspirations are tapped into; a teacher
>
> knows what needs to be taught and learned, but uses student
>
> interests to teach skills and knowledge. Students are asked what they
>
> think about something, and they are involved in decision making.
>
> Classroom relationships are based upon mutual respect. As a result,
>
> students are motivated and excited to learn.

Another teacher pointed out that the underlying difference between

the learning environments is that PBL is an emergent curriculum, "...where

the kids not only run the classroom but they guide the curriculum and create

the projects." Whereas in regular learning environments, the curriculum is

dictated by the district or the state and the teachers decide how to teach

it to the students.

Several teachers communicated that in a PBL environment, students

are able to work at their own level because they are constructing their own

learning. The teachers also said that there are more than just the typical

academic skills being learned. For example, one teacher remarked:

There's a lot of learning that goes on in PBL that is not traditional and

doesn't fall under the umbrella of school. There's a lot of life skills

that kids learn. There are a lot of social skills that kids learn and

there's a lot of real life assessment that kids get from Project-Based

Learning that they don't get in school normally.

<u>What role do you take on with the students when they are engaged in PBL?</u>

All of the teachers mentioned that they take on the role of facilitator

as their students engage in PBL. One described this role as:

To help the kids figure out what it is they want to do, to help them do

some organizing, to help them get the materials or resources they

need, and to help them come up with ideas, and then they sort of do it.

The teachers also talked about the role of directly teaching the

necessary skills that arise throughout the process of PBL. A few examples

of these skills include telephone etiquette, writing informal and business

formats of letters, and speaking to an audience. The importance of

documentation of the PBL process was also discussed by most of the teachers interviewed.

Two teachers remarked that their role changes depending on the project they are doing and depending on the kids that they are working with. Other roles that the teachers mentioned included: conflict management; asking the students questions about what they are doing and why (promoting self-reflection); presenting a foundation of the unit by teaching necessary basic information; helping create the standards or rubric by which the students will be assessed; partner in learning; cheerleader; checking in with the groups at different stages; involving parents in the project; modeling listening skills, note-taking skills, and how to operate within a group.

What do you do with a child who is unengaged with the project? What other challenges have you experienced with PBL?

The most common response to the first question was to identify the cause of the child's unengagement and address it. One teacher replied:

I think that the reason students are unengaged in a project is because they are not clear on where they can fulfill a need. They become unengaged because they are not as aware of what the opportunities

are. So I try to redirect them into taking a step back and looking at the big picture and where the gaps are that need to be filled. Other solutions included having the child do another piece of the project, helping the child to find something that they can be successful at, partnering them up with somebody else, taking time out from PBL if it is overwhelming and doing simple sheet work. Checking in frequently with the groups that are more unengaged, setting student generated goals and consequences right from the beginning, giving one on one guidance and encouragement, involving the parents in problem solving, and making sure everybody has a real job that takes their full attention and that they are responsible for were also listed as strategies. Creating a cooperation rubric for the group to rank each other on also works, using questions such as, "Were you a leader or were you a distracter? Did you do your part? Did you do more than your part?"

The challenge of time constraints was mentioned most often by the teachers. Other common challenges that the teachers brought up were: meeting district and state guidelines, educating parents about how much their children are learning, unevenness of leadership, pressure to do PBL, knowing when to step in or to step back, and kids who lose interest. The PBL teachers also spoke of the challenges of: messy projects that involve a lot of

materials; giving up control; not knowing what the outcome will be (also the magic and fun of it); very, very bright children who are accustomed to book learning and don't succeed as easily in PBL; gifted kids who think, "Oh, this is easy," and put things off until the last minute; having everybody in the group get their stuff done when they need to; students whose beliefs are totally opposed to aspects of the project; and group leaders misusing their power.

<u>How has student choice played a part in PBL? What do you do when students don't make good choices?</u>

The majority of the teachers questioned declared that PBL is student choice and that it's important to let kids make really bad choices because they learn more from their mistakes than from their successes. One teacher said:

> If they fail and recover, they feel really, really good. And most kids won't fail and just stay in failure. They will recover from it. They will undo their failure, fix it, get better, and get past it. But if you don't let them fail, the success is yours, not theirs.

Several teachers commented that in order for kids to learn from their choices, they need to be given the opportunity to reflect on them. The teachers help this part of the process by asking the students questions like,

"What did not go well? What would you do differently next time? How could you make it better? How far back do you need to go to rework it?" Two teachers commented that there really are no "bad" choices except for the obvious bad choices like when you put yourself or somebody else in harm's way. Otherwise, all choices can be a creative path to discovering something that other people would not have considered. From one teacher's perspective the challenge is to "learn how to facilitate and make their choices fit into what they need to learn and make it academic and successful."

<u>Do you see a relationship between student choice and achievement?</u>

All teachers interviewed said that there is definitely a relationship between student choice and achievement. They reported that the more choice students have, the higher the achievement, and that when students have a lot invested in what is going on, the learning is given lasting meaning and they are willing to try harder. One teacher stated, "In student choice, we're building in independence, we're building in taking risks, we're building in self-reflection, self-esteem, and empowerment. All these things are connected to their achievement. You can't fail with student choice."

Another teacher pointed out that when given real choice and real responsibility, students become incredible citizens, leaders, and high

achievers. The students are empowered to take on responsibility and are confident to stand up to not only be counted, but to make a difference. One PBL teacher observed the kids to be much more articulate, much more comfortable about getting up and talking in front of adults, and much more comfortable about writing and doing expository writing. The teachers attributed the abilities and empowerment that their children had gained to the fact that kids are engaged in and concerned about real-world situations and that the responsibility that they take on is real, not superficial.

Several teachers gave examples of students achieving through PBL when they are not normally successful in the more traditional ways of learning, for example from books or lectures from the teacher. One teacher remarked that a student's significant improvement in achievement this year was directly related to the fact that the student was liking school more. PBL had reached that student who was not being reached through other methods. The teacher said simply, "If you don't like something, you're not putting 100% effort into it." A different teacher noticed that when the children are permitted to follow their own interests, they get to see themselves in another light and the people around them do too. Thus, all of the teachers interviewed declared that there is a definite relationship

between student choice and achievement, and that the more a child is

invested in their learning, the greater their achievement will be.

CONCLUSIONS/IMPLICATIONS

Through discussing PBL with the teachers interviewed for this study,

it became apparent that PBL can vary depending on the teacher's personal

style of teaching, the needs and interests of the students, the available

resources, the physical environment of the school and its surroundings, and

the degree to which the school community is invested in PBL. Regardless of

the possible variables within the school setting, it is the opinion of the

author that the learning experience, both academically and socially, of the

students can be greatly enhanced by incorporating student choice through

PBL.

There are countless times throughout life where people must make

decisions and solve problems. In an ideal situation, there is plenty of time

and the support and advice of others to choose between alternatives. At

other times a decision must be made quickly and be based solely on the

consequences of previous experiences. Decisions may vary from simple to

complex and can have considerable effects on the lives of the decision-

maker as well as on others. Making good decisions can be learned and takes

practice. The project approach allows children to learn about and experience the decision-making process.

PBL gives students control over their own learning. From the beginning of a student-initiated project, the students decide on a course or courses of action based on their informed research of the project. Projects may range from a simple reorganization of their classroom to the complexity of adopting and protecting an endangered species. With the teacher serving as a facilitator, the students have a vested interested in accomplishing the goals they have set for themselves. Through the course of the project students think about real-life consequences as they communicate with each other and people in their community to make complicated decisions.

In solving complex problems students learn more than the standard academic skills that are traditionally taught in the classroom. As students develop and apply those skills in a meaningful context, not only do they gain further mastery over those skills and a deeper understanding of their applications, but they also learn essential real life skills that are not typically taught in schools. When students are given the chance to learn through experience, students learn how to learn, as well as gain an appreciation for learning.

People are motivated to do things that are stimulating, that they feel connected to, and that allow them to think at a higher level. When students are confronted with complex problems that are directly related to real-life situations, they will learn more from thinking through those problems and making decisions than if given a simple problem out of a textbook to solve. In order for children to take control in the direction of their own learning, the teacher needs to relinquish control. This does not mean that the teacher's role is no longer needed. It means that the learning should be more student-centered than teacher-centered.

This research study was conducted on a small scale, however its findings are still of notable importance. The data gathered from the sample of teachers supports the hypothesis that the more choice students have through PBL, the higher their achievement. In addition, the results also showed that a PBL environment is more meaningful, relevant, engaging, permanent, and energetic than other learning environments.

Because this research study took into account the views and ideas of only ten PBL teachers from four different schools, the results cannot be interpreted to reflect most PBL teachers. In order to generalize this study to the larger population, a much larger sample size would be needed. A larger

study could take into account the effects of student choice through PBL on students who are more academically and culturally diverse.

It is the schools' job to prepare students for the complexities of the real world in the 21st century. To accomplish this goal, a greater degree of learning will occur when the teacher steps back to allow for mistakes and bumps to happen along the path that the students have chosen. Students need to be given the strategies of problem solving such as analyzing, predicting, hypothesizing, and synthesizing information, in order to keep up with the daily changes in information and technology. Along with giving guidance, support, and encouragement, the teacher can help the students to reflect on the results of their actions and to consider their decisions from different perspectives. Students have the ability to construct their own learning and when empowered to do so, the result is life-long learners.

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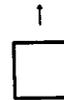affixed to all Level 2B documents

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