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Impacts of Project-Based Learning on Student Engagement

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Table of Contents

Abstract

The purpose of this paper is to share the results from an action research project that explored the impacts of Project-Based Learning (PBL) on in-class student engagement. This was done in a 10th grade world studies classroom that compared PBL to traditional instruction. The main patterns that emerged from this project showed that percentage of student engagement and types of higher order thinking increased when components of PBL were implemented in the classroom. This can be attributed to PBL's learner-centered approach, where the students' perspectives are continually taken into account and students are at the center of their learning process. As the needs of our students are changing, PBL allows us to keep up with these needs. Other patterns in the research show the positive relationship between PBL and teacher engagement in the classroom. The findings also suggested continued development of PBL strategies and a focus of more student involvement in developing PBL projects.

Keywords: project-based learning, learner-centered

Impacts of Project-Based Learning on Student Engagement

The needs of students are ever changing and the challenge to keep up with those needs can be daunting. Classrooms are not only becoming more diverse in all categories, generational changes are constantly evolving. The foundation of current educational practices originate in 1893, when educators anticipated the change from an agricultural based economy to and industrial one, creating the factory model of education that has stayed with us today (Dintersmith, 2018, p. 4). In that model, students together shifted from classroom to classroom on bell schedules, learning the content and skills from their teacher at the same pace. This reflected the industrial model or factory system that most students would enter at the end of their schooling. While this model was innovative and successful for the needs of the 20th century, it is outdated and does not fit the 21st century needs of our students where automation and machine intelligence it shifting our economy (Dintersmith, 2018, p, 13). We need to give students real-world problems, where they collaborate with other students and are coached along with adult support. Just as in 1893 our education systems needs to shift to meet the needs of 21st century learners.

Projects have been a part of education for over 100 years, most of these being teacher driven where content and skills learned come from the teacher (Larmar & Mergendoller, 2010, p. 1). To make these projects more meaningful and innovative, Project-Based Learning (PBL) strategies need to be implemented to meet the needs of 21st century learners. Standardized testing shows that students involved in PBL outscore their traditionally educated peers (Geier et al., 2008). However, standardized testing is not the only metric that is important in measuring how ready students are to enter the 21st century workforce. In one British study, students in a PBL program not only achieved the highest possible grade on the national exam than students in

a traditional track, but were also better in answering applied and conceptual problems (Boaler, 1999). In another study, students were asked to design a new playhouse for a community center. Not only were the vast majority student submissions deemed qualified to be built, these students were also able to revise their designs after consulting resources (Thomas, 2010, p. 40). These skills are necessary in developing highly motivated, critical thinking students for the future workforce.

Literature Review

A considerable body of research and theory show the positive relationship between student motivation and cognitive engagement (Blumenfeld et al., 1991, p. 370). One of the main reasons students dropout of school is because they find their classes boring and become disengaged (Cervantes et al., 2015, p. 2). Educators need to find ways to motivate their students in their ever increasingly diverse classrooms. The one size fits all approach has to change to meet the different motivating factors of their students. PBL allows for a student-centered approach, letting students self-differentiate to increase motivation. This gives students the ability to select their own interests and use the tools that best fit their needs. This differentiation provides intrinsic motivation for students to pursue deeper learning at their levels (Bell, 2010, p. 42).

One component of PBL that increases motivation is immersing students in real-world situations and real-world problems (Graesser et al., 2002). Unlike traditional instruction which tend to set up problems to be solved in a singular way, PBL allows for flexible thinking and solutions. This engages students in a story which is more memorable than other forms of narrative, especially for students that can be easily distracted. Stories allow students to build inferences and develop higher-order and creative thinking (Graesser et al., 2002). Placing learning in these meaningful contexts makes learning more engaging for students (Gallager, 2015, p. 227). It is also important that the structure of the projects promote inquiry through a driving question. Students find project work more meaningful if they conduct inquiry (Larmer et al., 2012, p. 3). Inquiry engages students' imagination and interests. Students begin with their own question, leading them to multiple sources to try and puzzle together their findings often leading to more questions. Students begin to realize that their problem and the world is complex

and to begin to solve these questions students need to collaborate and use the collective energy, experiences and creativity of the group (Bell, 2010, p. 41).

As a result, teachers implementing PBL also need to be ready for a vast array of problems to solve along with each student and groups. With students choosing their own solutions and routes in PBL, the teacher has to be ready for unique problems for each student and group. Although all teachers must be ready to deal with the different problems individual students might bring, PBL teachers in Mergendoller's study reported more planning, monitoring, scaffolding, adjusting and troubleshooting strategies (Mergendoller, 2001). Strategies to coach and help streamline students being able to self-manage their learning include making students aware of their responsible of doing and producing, establishing professional standards, providing examples of high quality work, introducing external resources (Mergendoller, 2001). It's also important to set clear consequences for failure and non-participation. A teacher implementing PBL needs to hold frequent conferences with students and/or groups, directing peer reviews and understanding the expectations of the project and rubric (Mergendoller, 2001). Along with the guiding questions and rubrics to set up student exploration, teachers need to coach their students along (Mergendoller, 2001). Instead of teacher as instructor it becomes more teacher as facilitator. The teacher is actively involved and encourages students to the complexity of their problem and helps students start to look deeper into their inquiry. Teachers can also arrange for experts or adult mentors to provide feedback, which is especially meaningful to students because of the source (Larmer et al., 2012, p. 4). This also can help students build connections outside of school and build positive adult relationships.

Since coaching is a large part of PBL classroom management is also different. Traditional instruction tends to focus on student discipline and pacing, keeping students in order to complete

the lesson in an orderly fashion (Kounin, 1970). This reflects the industrial model where

everyone must follow the same pace so efficiency can be maintained. Teachers set up routines

that fit all students and keep them progressing in the lesson. Classroom management is then

focused on minimizing behavior issues and disruptions. Classroom management for a PBL

teacher is learner-centered, focusing on students managing their own tasks, time, resources,

group work, learning and assessment (Mergendoller, 2001). As a result, teachers implementing

PBL have a broader set of management responsibilities than in a traditional setting (Everston, et

al., in press). PBL teachers also have to be ready to provide a larger variety of resources for

students. While the traditional classroom might only be concerned with a couple of sources, the

PBL classroom has to be ready to provide a vast array of resources (Mergendoller, 2001). With

today's ever changing technology, this also includes a variety of ways to access information.

Utilizing technology in PBL can also increase motivation by allowing students to self-

differentiate. Technology allows students to create their own representation of content and can

do so over several types of media. This lets students explore different types of technology, giving

them more control which is likely to increase motivation (Blumenfeld et al., 1991, p. 386) The

vast array of new technology that is at the fingertips of our students is constantly increasing and

along with that, their own preferences of which technology to use. This allows students not only

to differentiate in how they access information but also how they present their information.

While it might be hard for educators to keep up with the generational changes in student

preferences, this differentiation lets students use the media they prefer. Coaching and proper

structure of PBL guides students in proper use of technology. When students share their work

with their classmates it can give other students ideas of how to use technology, letting students

brainstorm of build off of each other's knowledge. This allows for greater creativity and out of the box thinking (Bell, 2010, p. 42).

For PBL to be impactful it is important that every step of the process has meaning including the end. This product does not have to be a paper, but can align with student strengths. Students who present a piece of artwork, video production, song, etc. love to show off their skills and encourages them throughout the whole process to produce their best work. It is important that students present their work. Work is more meaningful when it is not done only for the teacher, but rather when students present to an authentic audience. When students present to a real audience they are more concerned with its quality (Larmer et al., 2012, p. 4).

Although there is considerable positive research on the effects of PBL, implementing effective PBL has been difficult in education (Blumenfeld, p. 373). As stated earlier, projects have been around in education for over a 100 years, but there are many hurdles and a mindset that needs to be overcome in order to see the results of PBL and prepare our students for the 21st century world. Professional development needs to be provided to educational leadership to support them in meeting the needs of teachers, focusing on differentiation the individual needs of teachers (Cervantes, 2015, p. 63). Teachers must learn that the role of a teacher PBL is that of facilitator and coach, in order to assist students in fostering their own skills necessary to solve real world problems (MaKinster, Barab, & Keating, 2001). Flexibility and continuous training need to be apart of the process, with continual feedback. Developing routines and a natural system for feedback that is open and honest allows for teachers to take ownership of the process and continually improve on their practices (Cervantes, 2015, p. 46).

Since PBL is learner-centered, the perspective of the students need to be continually reevaluated. Many problems that arise from PBL are a result of student perspectives not being

sufficiently taken into account (Blumenfeld, 1991, p. 373). The complex nature of student

motivation, knowledge and skills need to be considered if students are to be the focus of PBL.

Questions need to be from the point of view of students instead of the adult perspective

(Blumenfeld, 1991, p. 373). One major factor that needs to be addressed is the expansion of new

educational technology that can support students and teachers. Technology is rapidly changing

and can be difficult for teachers to keep up with, but this is necessary to sustain student

motivation (Blumenfeld, 1991, p. 374).

Methods

Participants

The action research for this project was designed to measure the impact Project-Based Learning (PBL) has on in class student engagement. This was done in a 10th grade World Studies classroom at Johnston High School. Johnston is a wealthy suburb of Des Moines, Iowa with a student population of about 500 students per grade. While the demographics of Johnston's student population historically has been predominantly white, it has seen an increase in diversity in the last decade. Part of the increasing diversity has come from natural demographic changes between Des Moines and Johnston and local corporations such as John Deere and Pioneer bringing in high income families from across the world. Des Moines is also a welcoming city to displaced refugees from around the world which find a home in Johnston as well. Class sizes range from 28-32 students in a general education classroom with anywhere from 0-4 English Language Learners (ELL).

Table 1
Class makeup

Group	Total students	Male	Female	ELL students
2	32	20	12	4
3	31	18	13	2
5	28	14	14	3
6	31	17	14	2
8	29	14	15	0

Data Collection

To measure student engagement two instructional coaches were asked to randomly enter 5 different periods of a World Studies classroom and conduct Instructional Practices Inventory

(IPI) engagement surveys. Johnston High School routinely uses IPI surveys in its school

improvement plan (SIP), so instructional coaches are well trained and experienced in conducting

these surveys. These are designed to capture quantitative data on student engagement. The

Instructional Practices Inventory is a teacher led process, using Instructional Coaches and

Teacher Leaders to collect cognitive engagement data during class. IPI is supposed to be quick,

easy and useful for teacher improvement. It is designed to be minimally disruptive with a team of

two teachers entering a classroom for about 3-5 minutes and asking questions to students only if

necessary. Students are familiar with the process which allows the process to be smooth and

accurate. When instructional coaches enter into a classroom they look for two things: the number

of students engaged compared to the total number of students in the classroom and the most

common type of higher order/deeper thinking.

Data is collected for school improvement, so all teachers have the ability to study the data

and reflect on current educational practices. Data is meant for a snapshot of engagement for an

entire building, but teachers are able to seek out individual data if they want. The data collected

for this research project was separate from the whole school data, with a specific intent to see the

impact of PBL in the classroom. Two instructional coaches volunteered to collect data and

observe trends related to PBL and student engagement.

There are six IPI categories that data collectors identify. Categories 5 & 6 are when

students engaged in higher order thinking. Higher order thinking consists of analysis, critical

thinking, decision making from analysis, reflection, goal setting, strategizing from analysis,

evaluation, conclusion, synthesis from analysis and innovative thinking (Instructional Practices

Inventory, n.d.). What separates 5 from 6 is whether students are collaborating verbally. For

example, if students are engaged in high order thinking and collaborating amongst each other

orally or on a google doc, then they would be marked as a 6. If they are engaged in higher order

thinking but working alone, then they would be given a 5. A 6 is not necessarily better than a 5,

just a distinguishing marker. Category 4 is identified when the teacher is directly leading the

learning experience, with students willfully following along. Category 4 is often seen as direct

instruction. Categories 3 and 2 are when students are not engaged in higher order thinking and

the type of teacher engagement. Non forms of higher order thinking would be memorization,

basic fact finding, simple understanding, or recall of facts, details, processes, algorithms,

methods and strategies (Instructional Practices Inventory, n.d.). What distinguishes a 3 from a 2

is the type of teacher engagement. If the teacher is engaged in student learning, then a 3 would be

marked, while if the teacher is not engaged then a 2 would be marked. Category 1 is when

students are not engaged in the learning process. Data teams do not enter at the beginning or end

of a class period, in order to eliminate students finishing early or getting a late start on the

lesson.

   The data collected by the instructional coaches for this research project covered 20

different collections on 10 different days, spread over a month long unit. The types of instruction

being compared were traditional teacher led instruction to Project-Based Learning in a unit

dealing with the Cold War. Traditional teacher led instruction stemmed from instructional days

where lesson plans were designed for the entire class, mainly led by the teacher. Project-Based

Learning implemented components of PBL, where the lessons were driven by student choice and

the teacher acted as a coach and facilitator. The instructional coaches did not know in advance

what lesson they were going to observe. The IPI survey allowed them to enter the classroom for

about 3-5 minutes, occasionally asking students questions for further clarification on their type of

engagement. Their observations were quick, simple, yet comprehensive in nature. It allowed

them to quickly gather data that distinguished among four valuable forms of cognitive

engagement and identify the number of students engaged during class.

Findings

Data Analysis

While the research shows a link between Project-Based Learning and increased engagement, the researcher wanted to see the impacts of PBL on in-class student engagement in their classroom. Students appeared more excited for PBL learning and suggested they spent considerable more time on their work outside of class, but it was still to be seen how they would use their time in class with the more freedom that came along with it. The first part of IPI data collection looks at the percentage of students engaged. The researcher thought the percentage of students engaged would decrease with PBL. With traditional instruction the teacher plans all elements of the lesson where they can have greater control to make sure all students are working. With PBL, however, students have more control over their planning, goal-setting and implementation of their learning. They might be more motivated to work on their project and spend more time outside of class working, with less teacher directed structure students could get off task more easily. While coaching is an important element of PBL students still have more control how they use their time.

The second part of IPI data collection looks at the level of engagement. While the researcher thought percentage of student engagement might decrease, higher-order/deeper thinking of student engagement based off of IPI's categories, might increase. PBL's inherent nature forces students to build inferences and find connections among materials. To solve their real-world problem students need to set goals, analyze their findings and continually reflect on their progress. These problems are also hoped to encourage collaboration within groups and students able to brainstorm among other groups.

One concern over the data collection was the teacher's bias for PBL and their bias to be personally more engaged regardless of PBL or traditional instruction, knowing when an instructional coach would enter their classroom. To try and get the most accurate picture of student engagement in the classroom, instructional coaches were asked to come in as many times as they could at random over a period of a month. This would better ensure that the teacher did not know when they were coming and thus, either consciously or subconsciously, giving more effort in their teaching and coaching of students. One of the categories in IPI distinguishes when a teacher is not engaged in student learning. There are times when a teacher is engaged in other responsibilities such as responding to email or online feedback to students.

One goal was to get an accurate picture of teacher engagement in class. The researcher thought that teacher engagement might reflect that of the students, with personal engagement with students decreasing during PBL and increasing during traditional instruction for similar reasons. When a teacher has more control over a lesson in traditional instruction they might be personally more engaged as well. However, just as the researcher thought higher order thinking would occur more in a PBL lesson teacher engagement with students would also be deeper during PBL. In hindsight, the researcher should have asked instructional coaches to come in at random for only one particular period over a longer period of time either a two and three month period or even a semester. This would ensure the control of one group being analyzed, while also giving a true picture of teacher engagement in the classroom.

Data collected over the course of one month and 20 different observations is shown in Table 2.

Table 2
PBL vs. Traditional Learning Engagement Data

| Group | Project-Based Learning | | Traditional | |
	Average Percentage of Engagement	Mode IPI Score	Average Percentage of Engagement	Mode IPI Score
2	96%	4	--	--
3	--	--	74%	3
5	83%	6	85%	4
6	89%	4	83%	2
8	--	--	86%	2,4

Note. -- = data not available.

Summary of Major Findings

From the data there are multiple patterns that emerge. The first is that contrary to what the researcher thought, the average percentage of student engagement was higher in PBL than during traditional instruction. Period 2 actually had an average of 96 percent of students engaged. One could attribute this to being earlier in the day, but you don't see a pattern from PBL or traditional of engagement decreasing throughout the day. For example, data from traditional lessons actually shows the highest percentage of engagement last period. You also do not see average percentage of students engage decrease throughout the day for PBL instruction either. The lowest average percentage of engagement actually occurs during 5th period at 83%. Overall, when comparing average percentage of engagement PBL consistently showed higher percentages

with 96,83 and 89%, while traditional instruction's highest engagement was only 86% with 74,85 and 83%.

One reason a higher percentage of students were consistently engaged in class could be from students being able to self select their preferred technology. The research showed that student motivation increases when students are able to self-differentiate through technology. While traditional instruction can lend itself to differentiation with technology, PBL's inherent makeup consistently allows students to select their own technology. Students were not only shown up to date technological resources from our media center coordinator, but also allowed students to brainstorm off other student ideas. By accessing the creative power of the collective class, along with a specialized trained educator in up to date educational technology, students were able to explore and use their preferred technology.

Another reason for a pattern of increased in class engagement of PBL could be the student-centered approach of PBL. Although student motivation can be complex, the nature of PBL allows instruction to be focused on the student's perspective. With students being responsible for choosing their own technology and problem, they are more personally invested in their success. While this can also cause problems for some students who do not feel up to task for such responsibility, the teacher or media center coordinator can assist them with ideas. While this might take away some students' feeling of responsibility it can be a step towards autonomy for some students who normally are not given the chance. This personalized help can build confidence in students to take initiation for themselves. This differentiation allows educators to meet students where they specifically are at and hopefully increase a feeling of ownership and student engagement.

Comparing the types of engagement only one period had a mode of category 6, distinguishing it as higher order thinking. This was surprising, as the researcher was hoping for more types of higher order engagement in both PBL and traditional instruction. For traditional instruction there was no type of high order engagement, with most of them complying with the instruction. While IPI data is only a snapshot of student engagement, the researcher was interested to see if there was any type of high order engagement outside of class. While this cannot be done by instructional coaches for obvious reasons, the reflection process could give insight to this with both quantitative data from a Likert or rating scale or qualitative data by student responses.

In regards to teacher engagement, it was surprising to find that is was PBL not traditional instruction where the teacher was more engaged. For PBL there were no 2 ratings. For traditional 6th period showed the teacher as not engaged and 8th period showed a split between teacher engagement and disengagement. Reflecting on the data for both units students were more likely to ask questions about their project when they had their own voice and choice in their learning. For traditional instruction, students were more likely to ask their peers for answers to simple questions or questions that they were all working on. Some of this could be attributed to the fact that since all students were working on something similar, it was more likely a peer would be able to answer a question that they had. For PBL, however, students were more likely to seek out the teacher to answer questions that would not be related to any other peer group. The researcher also noticed they might be more engaged when student enthusiasm increased.

Due to some of the unique problems students faced, they were more likely to ask the teacher about possible solutions. Also, students appeared on the whole to be more enthusiastic about their projects. The teacher noticed that when students were more excited about what they

were working on, they were more likely to discuss their project with their teacher. This was seen

on both the content that students got to choose from and the mode at which students were able to

present their project. It appeared that students who are generally engaged, were more engaged

when they were able to choose their own content, while students who are generally disengaged

were more engaged when they were able to decide the way in which they got to present their

information. The teacher found themselves interacting more with students as a result of this

enthusiasm.

Teacher engagement could also be tied to more of the responsibilities that come along

with PBL. While projects might appear to be front loaded and then let the students loose, PBL

forces teachers to frequently check in with students to make sure they are meeting deadlines and

maintaining high standards to meet the requirements of the rubric. Since student groups had

chosen different types of media to present their findings, clarification and examples were needed

for their specific project. Just as novelty increases students' engagement and creativity, the

novelty of student problems engaged the teacher in new ways. Instead of solving the same

problem throughout the day, there were many different problems to solve. These new problems

did not create a burden but rather made increased positive interaction among the teacher and

student groups. It was a way to show that many problems in the world are not simple and solved

in one way, but often unique and need complex reasoning. Also, groups that were behind on

deadlines received personal conferences in strategies to get caught up. This more student-

centered approach allowed some students to excel by themselves, while targeting other students

that needed more teacher guidance.

The teacher also collaborated with the media center coordinator to give students more

technological options to present their work and ensure proper sourcing of academic material.

Delegating responsibilities to another educational professional did not lesson the teacher

workload to coach students during class time. While the teacher might have recommended

students to the media center coordinator, this opened the teacher up to solve content problems or

any other type of logistical problems that might arise. Adding more adult support options to

students allowed students to receive coaching with different expertise.

Discussion

Further Study

While discussing the data with instructional coaches, they noted another piece of anecdotal evidence. During PBL some students would ask to work in the commons, which is monitored by other supervisors. The teacher would occasionally walk out into the commons to see their progress and if they had any questions. What the instructional coaches noticed is that percentage of student engagement decreased when students went out into the commons. This was a little disappointing as the teacher was hoping that if students had more control over their learning their enthusiasm would also increase, not needing a teacher to monitor them. When the teacher would go out into the commons they did notice them working. It appears that while students would change their work habits for their teacher, they did not feel the need to change their work habits if another educator saw them. The benefit of having instructional coaches gather data is getting a better snapshot of student intrinsic motivation.

While our instructional coaches suggested checkpoints for students to accomplish when they are out in the halls, the teacher thought this was a good time to reflect on their own PBL instruction and how they can make it even more engaging to students. Coaching student executive skills is an important part of PBL instruction, but it is hoped that the PBL unit would better intrinsically motivate students. The researcher would like to look at different areas that affect student intrinsic motivation. As students are motivated by many different things, it would be helpful to see what the different factors are that influence different students. Students that went into the commons were often more likely to be students who did not like the traditional physical classroom. They wanted the freedom of the open area, comfortable seating and the ability to move around. However, with these freedoms it appears they still lacked the intrinsic

motivation to stay engaged in their learning. It would be interesting to see what factors would be able to corral their strengths and increase their motivation.

The literature pointed to the importance of maintaining the focus on learner-centered questions and taking into account the students' perspective. The researcher would like to collect more qualitative data that focused on student perspectives and the current research on individual and developmental differences, motivational orientation, cognitive strategies and metacognition (Blumenfeld, 1991, p. 373). This can be done with instructional coaches, a team of teachers and the media center coordinator. Implementing routines and strategies from evidence-based data during our PLC time could help out with this. Also, continuing to utilize the expertise of our media center coordinator will be extremely important. The have the time and specialization to focus on new educational technology and research strategies that focuses on student learning and motivation.

One instructional coach also recommended a Project-Based Learning professional development opportunity during the summer. The literature showed the need to continue professional development to better aid teachers in becoming facilitators and coaches in the PBL classroom. The PD focuses on the different components of PBL and common misunderstandings of what PBL is. It also gives teachers different tools to become better coaches and facilitators and how to better take into account students' perspectives. The same instructional coach discussed taking routines from the PD and implementing them in our PLC time when we are working with our content teams. Further collaboration among teachers would help in developing better learner-centered PBL.

The researcher was also interested in looking into the relationship between student enthusiasm and teacher engagement. Anecdotally, the researcher noticed that when students were

more enthused about their projects, the teacher's engagement increased. This could stem from a variety of factors. One might be that when students are more enthusiastic about their project, they are more likely to seek the help of their teacher or other adult support coach. From the perspective of the teacher, the teacher could be more likely to engage with multiple students and with greater enthusiasm if they see their students are excited about their learning. It might seem obvious that when enthusiasm increases, engagement does as well but it would be interesting to research the different factors that play a part.

While a learner-centered approach comes first, it is also important to look at reasons for teacher engagement and enthusiasm. If there is a direct correlation between teacher enthusiasm and student engagement then it would be important to look at the different factors increase teacher enthusiasm. The research shows that PBL requires more responsibilities for educators (Mergendoller, 2001). While this could be discouraging to educators, if they saw the benefits of the increase in their more responsibilities, they could be more likely to implement PBL strategies that focus on learner-centered solutions. However, it would be important to research what factors have the biggest influence on teacher engagement and enthusiasm to allow educators to see the fruits of their labor.

Limitations of the Study

The researcher was concerned about the teacher consciously or subconsciously manipulating their lesson plans or altering their normal engagement to influence student behavior in class during data collection. If the teacher knew when data collectors were going to arrive in their room, then they might make additions to their lesson plans to ensure different types of higher-order thinking. They also might alter their normal type of engagement to increase percent

of student engagement in class. By walking around more or interacting with multiple groups they

could sway the data to show more engagement.

Also, since teacher engagement was being collected, simply by being up and around the

room during data collection could alter honest results. As a result, the researcher asked data

collectors to come in during any world studies period throughout the day for a month. This

would better ensure that the teacher was implementing their normal lesson plans and true teacher

engagement. While this could help out with teacher bias, it does not allow for a consistent

control group to be examined. There are different students in each period and different variables

that come along with each class. The researcher was hoping that enough data would be collected

from one period during the month that would give an accurate picture of student engagement.

Unfortunately, this was not the case. What the researcher should have done instead, was ask the

instructional coaches to come in over a longer period of time. The researcher could also have

informed the instructional coaches of the necessary times of data collection that would be

necessary for proper data analysis. Since this was not the case only patterns could be deducted

from the data collected. While still useful it will be necessary to make these changes.

Another limitation to the research is the degree to which PBL components are

implemented with fidelity. Projects have been around for a very long time but implementing

effective PBL has been difficult in education (Blumenfeld, p. 373). If all components of PBL are

not implemented the data might not show accurate results. Professional development is not only

necessary for teachers but all educators and professionals in a school district (Cervantes, 2015, p.

63). While the teacher did receive some professional development in PBL, more would allow the

teacher to better implement PBL. Not only is professional development for the teacher but also

instructional coaches and district administrators. Patterns from the data showed areas where there

was a lack of student intrinsic motivation. More professional development across the school

district could give a more accurate picture of data. At Johnston Community School District there

is a push for teacher professional development in regards to PBL, as evidenced by the PBL

session that happened in the summer of 2019, but in order to maximize the effects of PBL in the

classroom support for professional development in educational leadership would help as well.

Conclusion

The needs of students are changing and it is necessary that education adapts to these needs. It is important to continually look at current research on best educational practices and better ways to motivate students to help them see the relevance of their education. The research for this project focused on the impacts of PBL and its affect on student engagement. The collaboration with two instructional coaches and the media-center coordinator greatly helped in gathering resources, collecting data, analyzing that data and looking at suggestions for future improvement. The findings in this action research project show the positive impact on student engagement with the implementation of PBL and the positive impact on teacher engagement. However, the results show a need for further professional development in PBL practices. Professional development can include attending workshops, collaborating online and continued research into PBL components. It also means including routines in collaboration time throughout the year with colleagues during PLC. The research also shows a need to include students into the conversation to design better student-centered projects, finding input from all sectors of the student population.

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