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ARTICLE

A qualitative study using project-based learning in a mainstream middle school

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Abstract

Project-based learning taps into students' interests by allowing them to create projects that result in meaningful learning experiences. The method requires teachers to identify projects that challenge students to work individually or in groups to create plans, solve problems they encounter, test their ideas, and present their projects to peers. The article shares lessons learned in a mainstream middle school that in collaboration with the authors developed and implemented project-based learning. The effectiveness of the implementation was assessed by analyzing teacher acceptance and student engagement. The approach presented teachers with a unique set of problems involving time, fairness, and control; however, the authors concluded that teachers accepted the project-based learning teaching approach and that students were highly engaged in the process.

Keywords: motivation, student engagement, teacher acceptance

Introduction

Mainstream public schools in the United States appear to be facing a dire situation. According to Greene and Winters (2006), approximately 30 per cent of school students who start high school today do not finish. Not only are the lower performing students leaving school; high performing students are uninterested in their education as well. In *The Silent Epidemic: Perspectives of High School Dropouts*, Bridgeland et al. (2006) declare that 88 per cent of dropout students surveyed had passing grades, and about 50 per cent left school because they were bored. In 'Bored of education', Wolk (2001) cites a similar survey conducted 10 years ago in which students chose 'boring' as the number one word that best described their school experience and 'nothing' as the word that described what they liked best about school. Students' attitudes seem to have changed little over the past decade, however today they are acting on their dissatisfaction by dropping out of school.

Project-based learning[1] is one approach to teaching that is motivating students and improving schools across the US because it inspires students to learn and changes their attitudes about school (Blumenfeld et al., 1991; Grant and Branch, 2005; Levine, 2002; Littky and Grabelle, 2004; Newell, 2003; Thomas et al., 2005;). Charter schools,[2] which have more freedom to design their own curriculums, tend to use project-based learning more than mainstream public schools. Markham (personal communication, 10 January

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2007) estimates there are approximately 2000 schools in the United States within the small schools movement[3] that use project-based learning in one form or another.

Project-based learning is a teaching method that taps into students' interests because it allows them to create projects that result in meaningful learning experiences. Railsback (2002) has identified a number of important benefits of project-based learning: it is active not passive; it is interesting and relevant to the student; it allows for autonomy and self-directed learning; it increases communication skills; and it enhances motivation to learn. Increasingly, teachers and schools across the US are beginning to use this method because they know it engages and motivates students to learn.

Ron Newell and Doug Thomas are co-directors of EdVisions,[4] a non-profit organization that has created over 30 charter schools across the nation that use project-based learning as the centerpiece to their curriculum. Newell (2003) defines project-based learning as a process that:

> emphasizes student interest rather than following a fixed curriculum; emphasizes a broad, interdisciplinary focus rather than a narrow, discipline-based focus; uses direct, primary, or original sources rather than texts, lectures, and secondary sources; emphasizes data and materials developed by students rather than teachers. (p. 5)

Another organization promoting the use of project-based learning is the Buck Institute for Education (BIE). The organization published the *Project-based Learning Handbook: A Guide to Standards-Focused Project-based Learning for Middle and High School Teachers* (Markham et al., 2003) to help educators integrate it into their existing curriculums. Numerous teachers and schools are currently using the handbook across the United States. The handbook defines project-based learning as 'a systemic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks' (2003: 4).

The authors of this article agree with these definitions, but in addition include four distinct elements of the inquiry process (problem, plan, test, reflect) that occur when students design and complete projects. Our definition of project-based learning is *a teaching method where teachers guide students through a problem-solving process which includes identifying a problem, developing a plan, testing the plan against reality, and reflecting on the plan while in the process of designing and completing a project.* Our definition relies heavily on what Dewey refers to as the 'pattern of inquiry' (1938: 101), where students create plans and test them against reality to determine their worth.

Problem-solving is a critical component of project-based learning. Projects are the catalysts that initiate the planning, testing, and reflecting phases, and as students design and build their projects they must solve problems that arise. For instance, when a group of seventh grade students are assigned to write and perform a puppet show they must solve multiple problems such as writing and editing a story line, designing and making puppets, and building appropriate props. Practicing their performance may help them improve upon their story line, puppet designs, and prop designs. A better project is created when students engage in problem solving through a trial and error process.

Teachers should be cognizant of this inquiry process and attempt to guide students through all four steps; however, learning may be hindered if teachers inform students of

the four-step process. In general, younger students are not interested in understanding the learning theory, and instead desire to create and design a project that is meaningful to them. Attempting to provide students, especially younger ones, with a detailed theoretical understanding of project-based learning may restrict rather than enhance learning outcomes.

Projects should be challenging so that students engage in critical thought during the planning, testing, and reflecting phases but not so challenging as to halt the learning process. For instance, when a teacher in a technical education classroom provides students with a step-by-step process and demonstrates how to build a miniature catapult little, if any, problem solving is necessary. The students are not challenged in the situation because they simply copy what the teacher has demonstrated. On the other hand, planning, testing, and reflecting become an integral part of the learning process if this same teacher explains to students that they need to build a working catapult with certain materials and resources and then allows them to experiment on their own. Challenging students by providing them with opportunity for creative thought allows them to explore and determine what the best building process might be. Project-based learning inspires students to solve problems, which may ultimately lead to a broader and more complete understanding of the material.

While there are other charter schools using project-based learning, those operated by EdVisions use project-based learning exclusively. Students at EdVisions schools are allowed to create, design, implement, and complete meaningful projects, which are then turned into credits required for high school graduation. EdVisions' schools are unique in that students are given the freedom to choose projects that they are interested in, and the students, not teachers, ultimately drive the tempo of the learning process. Other charter schools such as those created by The Big Picture Company[5] and Expeditionary Learning Outward Bound[6] also use projects as a main component in their curriculums; however, in these schools projects are supplemented with other activities such as internships, service learning opportunities, and traditional coursework. These innovative schools and their creative methods of teaching are beginning to gain the attention of more mainstream public schools.

In addition to the organizations and schools mentioned above, there are a number of publications that support the use of project-based learning and describe how to implement project-based learning in mainstream school settings (Markham et al., 2003; Newell, 2003; Railsback, 2002; Thomas et al., 2005). These publications provide theoretical justifications and anecdotal evidence that suggests project-based learning enhances motivation and student performance. Unfortunately, research articles verifying these claims are sparse. The authors of this article are adding to the research by examining two elements to determine the effectiveness of using project-based learning in a middle school setting: teacher acceptance and student engagement. While research on the effectiveness of using project-based learning with middle schools is limited, several studies have examined the effectiveness of using project-based learning in mainstream public schools.

Cornell and Clarke (1999) conducted an extensive study on standards based teaching and learning for the primary purpose of moving teachers away from a teacher directed lecture format towards a student centered format where students are more engaged by initiating and completing projects. They found that students were more engaged when involved in project-based learning because it gave them an opportunity to work with

other students while doing hands-on activities, which provided them with a more self-directed learning environment. Even lower performing students enjoyed the process because it not only gave them an opportunity to discover unique skills necessary to complete projects, but allowed them to progress at their own pace.

However, two of the paradoxes they discovered, 'less teacher talk requires more teacher time' and 'free-ranging self directed inquiry depends on a tight design structure', indicate that even though motivation and student learning were enhanced through the project-based learning process, it requires more work for teachers when designing projects and preparing lessons (p. 94). Teachers commented that the initial phase of the project-based learning process required a fair amount of planning time; however, once established, they were able to focus more on guiding students through the process.

Liu and Hsiao (2002) conducted a research study on using project-based learning with middle school students and found that it increased their 'learning of design knowledge, their cognitive strategy use, and their motivation toward learning' (p. 311). Students assumed the roles of researcher, graphic artist, programmer, project manager, and audio-visual specialist and worked together to complete multimedia presentations. Because students were directly involved in the process they were able to understand and retain the information they were using while creating and designing their multimedia presentation. This study is a clear indicator that project-based learning has the potential to enhance both student motivation and performance in the classroom.

Barron et al. (1998) also discovered that academic performance and motivation are greatly improved when using project-based learning. In their comprehensive study they had students create blueprints of chairs and playhouses, and then present these drawings to their classmates. They measured low, average, and high achieving students and found that all three groups had significant improvements in their ability to understand difficult math concepts after using the project method. This approach to learning not only had a significant impact on their comprehension, but it also had a positive impact on their motivation. Fifty per cent of the students interviewed about their experience specifically mentioned that the projects were a very important part of their fifth grade year. In summary, these authors claimed that students showed 'substantial gains in their abilities to understand, use, and present geometric concepts' (p. 303).

Methods

The principal of Dakota Meadows Middle School (DMMS) in Mankato, Minnesota solicited assistance from the authors of this article to help the school integrate project-based learning into the curriculum. After initial meetings it was determined that a research project would be designed to help them determine the effectiveness of using project-based learning in a middle school setting.[7] The effectiveness of project-based learning in the research project was determined by analyzing two interrelated elements: teacher acceptance and student engagement. After meeting with the leadership team at DMMS several times the authors created a plan to implement project-based learning and determined what research instruments would be most applicable. The instruments chosen for the research included surveys, interviews, and staff training sessions. Data were collected throughout the 2005–06 school year.

The first survey was conducted in August 2005 and consisted of the following four questions.

1. What is your definition of project-based learning?
2. Have you used project-based learning in your classroom? Provide an example.
3. What are the challenges of using project-based learning?
4. What are the benefits of using project-based learning?

This survey was used to assess teacher knowledge about project-based learning and their current use of project-based learning in their classrooms. Thirty-five teachers answered the first survey, which was used to determine the baseline knowledge of project-based learning. It should be noted that this survey was conducted on a staff development day and included special education teachers and exploratory teachers.[8]

The initial survey was followed by a six-hour staff development workshop on how to integrate project-based learning into the classroom. The objective of the staff development day was to provide teachers with information on how to use project-based learning in their classrooms so they could begin implementation. Definitions, practices, scope, classroom culture, project process, and obstacles were discussed during the day, and project-based learning examples from history, English, and science classes were provided. The following is a synopsis of the information the authors provided teachers.

Problem solving

A primary goal of DMMS for the year was to increase problem-solving skills in their students. It was important for the authors to explain how Dewey's 'pattern of inquiry' (1938: 101) is an integral part of project-based learning. The 'pattern of inquiry', which includes the identification of a problem, planning, testing, and reflecting phases, was explained and several examples of how this process interfaces with project-based learning were given.

Scope

The scope of a project refers to the amount of time required to complete a project. Examples ranging from 50 minutes to full semester projects were provided. Due to the time constraints of mainstream public education, an emphasis was placed on providing students with small projects that may be completed in one or two 50-minute class periods.

Culture

Classroom culture was discussed and dominated a fair amount of discussion. Issues such as teacher's role, control, freedom, process and content were explained in depth. The role of the teacher using project-based learning is to guide the students in designing meaningful projects and allow them time to complete and present the projects to their peers. Below is a list of points emphasized during this portion of the discussion:

1. The teacher acts as a guide allowing students to make mistakes and learn from them along the way.
2. Teachers should provide students with freedom to experiment in order to discover solutions to the problems they encounter.
3. The student may need to undergo a series of trials and errors as they attempt to complete the project.
4. The teacher should provide students with resources and information when they get stuck so that they can continue moving forward with their learning.
5. The problem solving process becomes as important as the content being learned.

Project process

The project process was outlined for teachers and included two important pieces: a proposal and an assessment tool. Several sample project proposal forms were reviewed and included information such as title of project, resources needed, a written plan to complete the project, how the project may be applied to real life settings, and identifying potential learning outcomes. Teachers were told that they could use any of the forms handed out or create their own. Assessment tools were also discussed and resources such as rubrics and websites were provided. Teachers were given the freedom to use any of the already existing rubrics that were handed out or create their own for their specific disciplines.

Obstacles

Finally, obstacles such as time, money, and resources were discussed. DMMS has 50-minute periods so an emphasis was placed on small projects that could be completed in shorter time durations. Larger projects may require extra money, however project examples were provided that require little if any money. The same applies for resources because larger projects usually require more resources and smaller projects fewer resources.

DMMS is separated into four trails and each trail consists of six to eight different content teachers. After the staff-development day each trail had one meeting during the first semester with one of the authors to discuss problems and concerns with integrating project-based learning. One of the authors was available to assist teachers with problems and concerns during these one-hour meetings.

In February a second survey was conducted to determine how many teachers were using project-based learning:

1. I am using project-based learning in my classroom:
   Yes/No
2. I am using a problem-solving process with project-based learning, which consists of:
   - identifying a problem
   - developing a plan
   - testing the plan
   - reflecting on the process

   Yes/No
3. If you responded 'Yes' to question 2, please respond to the following:
   - students' ability to identify a problem
     increased/stayed same/decreased/N/A
   - create a step-by-step process to solve the problem
     increased/stayed same/decreased/N/A
   - apply their step-by-step process in order to determine a solution
     increased/stayed same/decreased/N/A
   - reflect on the problem-solving process and if appropriate, make adjustments
     increased/stayed same/decreased/N/A
4. I am using a problem-solving rubric in conjunction with class projects.
   Yes/No

In April 2006 seven individual interviews were conducted with teachers to gather more in depth information on teacher acceptance and student engagement. The teachers interviewed

were chosen based upon their interest in using project-based learning in their classrooms. They were asked seven questions:

1. How did project-based learning affect the problem-solving skills of your students in your class?
2. How often did you engage your students in the problem-solving process?
3. How often did your students apply problem-solving skills while involved in a project?
4. What are the strengths of using project-based learning?
5. What are the challenges of using project-based learning?
6. What components of the problem-solving process (Problem, Plan, Test, and Reflect) were a) most often used by your students, b) least often used by your students? Why?
7. Will you continue to use project-based learning in your classroom?

Findings

On the first survey teachers had a weak understanding of the authors' definition of project-based learning: a teaching method where teachers guide students through a problem solving process which includes identifying a problem, developing a plan, testing it against reality, and reflecting on it while in the process of designing and completing a project. On question one, 34 of the 36 teachers did not mention problem solving as a key aspect of the project-based learning process, and defined it either as 'completing a project' or as 'hands-on activities.' Eighteen teachers fashioned their definitions around the concept of doing a project to show what students have learned, and 11 teachers included the words 'hands-on learning' in their definitions. Project examples (question 2) focused on an end product or culminating experience requiring a full day to complete. Examples of projects tended to be vague such as 'research papers, labs, hands-on activities, outside projects, displays, and field trips.' Other examples were large in scope, requiring an extended period of time to complete (a semester or even longer), and were usually identified as culminating experiences occurring either at the end of a semester or at the end of the school year. Nine teachers gave examples and definitions using the words 'community outings, community service, outside projects, and field trips.' Their definitions of project-based learning required students to experience things in a community or in an environment outside the school building.

Teachers identified a number of benefits from using project-based learning (question 3). Thirty of the 35 teachers identified at least one of the benefits mentioned by Railsback (2002). These benefits include: active, interesting, relevant, autonomy, self-directed learning, communication skills, and motivation. They were able to identify benefits even though most were not using this approach in their classrooms.

In February 2006, after the staff development day, 26 of 34 surveys were collected. All 26 teachers answered 'yes' to using project-based learning, and 23 of the 26 answered 'yes' to the second question: 'I am using a problem-solving process with project-based learning, which consists of identifying a problem, developing a plan, testing the plan, and reflecting on the process.'

The second section of the second survey asked teachers to respond to the students' ability to (i) identify a problem, (ii) create a step-by-step process to solve the problem, (iii)

apply their step-by-step process in order to determine a solution, and (iv) reflect on the problem-solving process and if appropriate, make adjustments. The majority of teachers who answered yes to using project-based learning also identified an increase in the students' ability to use all four components of the problem solving process. This means that a number of the students at DMMS were engaged in project-based learning, and teachers were consciously attempting to create learning experiences that used the four components of project-based learning in their classrooms.

In April 2006 seven teachers were interviewed. During these interviews the projects came to life. One teacher discussed how her students had created Roman coliseums and other Roman architecture using food such as cake and jello molds. The pictures she shared depicted the time and effort students put into their projects. Another teacher had students create personal collages that displayed the student's interests and hobbies, which were then presented to the class as a way to get to know each other better. In a communications class, students videotaped and presented their own puppet shows. Other projects included building small wooden bridges to see how much weight they could hold, building small boats powered by rubber bands to see how far they could move on a small pond, science posters with information about famous scientists, and computer generated projects like CAD drawings and Powerpoint presentations.

Besides sharing projects, the teachers also responded to the following questions:

On question 1, *how did project-based learning affect the problem-solving skills of your students in your class*, six of the seven interviewed stated that problem-solving skills were enhanced or improved when they were using project-based learning in their classrooms. On question 2, *how often did you engage your students in the problem-solving process*, six of the seven stated that they were engaging their students in problem solving at least twice a week and four of the seven stated that they were using it at least 90 per cent or more during the year. On question 3, *how often did your students apply problem-solving skills while involved in a project*, five teachers stated that students were applying problem-solving skills 'daily' or 'almost daily.' A variety of strengths were mentioned in response to question 4, *what are the strengths of using project-based learning*, including, promotes discussion and peer teaching, enhances student ownership, increases higher order thinking and life skills, and promotes group cohesiveness. In addition, the following comments were made: 'Students like it because it challenges them'; 'They are excited about it and retain more'; 'They understand and comprehend the material'; 'The upper end and lower end students work together towards a common goal with group work'; and 'Students like to have choice and they buy into the process'.

The challenges of using project-based learning (question 5) revolved around three issues: time, fairness, and control. Four of the seven teachers interviewed stated that it takes more time to plan and implement project-based learning; two mentioned that certain students do more work than others when involved in group projects, and one mentioned that it was difficult to let go of the control in classroom and allow students to work on their own.

Components of the problem-solving process most often used (question 6) consisted of a combination of the problem, planning, and testing. These three were used often in a variety of combinations. The component least often used was reflection. Six of the seven said 'yes', 'absolutely', or 'definitely' when asked if they would continue using project-based learning (question 7) and one said she preferred using a problem-solving method over a project-based method.

In addition to the above statements there were other comments, which underscored the value of project-based learning. An art teacher made the following comment, 'I saw a kind of unity take place with kids. They bought into it right away because any type of activity that you get them involved in they respond in a positive way.' In a similar vein an English teacher stated, 'project-based learning basically forced the students or put them in a position where they were able to work together towards a common goal. That is something they don't get on a day-to-day basis and something I feel they need. They were able to achieve that through a project.' These statements suggest that motivation and student engagement may have been enhanced because students were placed in a situation where they had to work together with their peers to achieve common objectives.

Discussion

Teacher acceptance

'Educational change depends on what teachers do and think-it's as simple and as complex as that' (Fullan, 2001: 115). Without teacher acceptance, implementing innovative approaches in the classroom like project-based learning are dead in the water. Fortunately, the teachers at DMMS accepted the information provided at the staff development day and utilized it in their classrooms. Fullan (2001) suggests that implementing changes in the classroom may take two or more years, and teachers are the key to innovation provided that 'the innovation is clear and practical, they have a supportive district administration and principal, they have opportunity to interact with other teachers, they have advocacy from the union, and are given necessary resources' (p. 60). The teachers at DMMS have the support of the administration and found the innovation clear and practical. Although it is too early to determine whether teachers will continue using project-based learning at DMMS, results as of February 2006 showed that all of the teachers who answered the survey were using it in their classrooms, and 88 per cent were integrating problem solving via the project method. This is a clear indication that most teachers accepted this methodology because they continued to use it for seven months after the staff-development day in August 2005. Teacher acceptance was even more apparent during the interviews. Teachers used words and phrases like *excitement*, *challenging*, *holistic*, *higher level thinking*, *ownership*, *comprehension*, and *retention* when they were observing project-based learning in their classrooms. They realized that students were engaged and enjoying the process, which is why they continued using and refining this method in their classrooms.

Another strong indication of teacher acceptance occurred during the trouble shooting sessions with each trail during the first semester. The authors observed a strong commitment to the process because most teachers were eager to ask questions about the process and were excited to discuss possible solutions to their questions. During these sessions teachers became aware that they were going through the same process as their students: identifying problems, developing plans, testing plans, and reflecting on them. In essence teachers realized that they were involved in a problem-solving process while doing a project (i.e. attempting to implement project-based learning in their classrooms). This awareness appeared to help them understand how problem solving is connected to project-based learning and ultimately how to better implement it in their own classrooms. By the end of these sessions most teachers were excited to get back into the classroom and try out new ideas discussed during these sessions.

Student engagement

Students appeared to be highly engaged in the project-based learning. In some cases teachers utilized group projects, which created a situation where students had to work together discussing possible solutions to problems, agree on the plans they created, and implement them through experimentation. According to teachers, some students contributed more than others in these groups, but all group members had to be involved in the process either by contributing to discussions, writing up plans, doing the actual project, or presenting the project to the class.

Other teachers who used individual projects mentioned that students were focused and excited about doing their projects. Teachers mentioned that they could observe the level of engagement by watching students in class. In most cases students were given freedom when designing their projects, which allowed them to take ownership and responsibility for completing and presenting them to their classmates. Lecturing creates a situation where students perceive the need to memorize the information for a test, whereas the process at this school created a situation where students were solving problems and thinking their way through the steps of the inquiry process. Students were motivated to complete their projects because they were challenged by their teachers to create projects that were unique and different. Students appeared to be much more engaged with this process as opposed to other more passive methods of learning where teachers do most of the talking.

Conclusions

Our research concluded that teachers accepted the project-based approach and that students were highly engaged in the process; however, this approach presents teachers with a unique set of problems. This method is a non-traditional approach to learning, and it requires teachers to identify meaningful projects that challenge students to work either individually or in groups to create plans, solve problems they come across, test out their ideas, and present their projects to peers. Teachers must relinquish some control with this approach and allow students to work independently for periods of time. Teachers may be uncomfortable with this approach, especially when students make mistakes and flounder during the process. However, in this valuable aspect of the learning process students learn from their mistakes and realize they must re-evaluate their plans and implement them in different ways until they find a solution. With this process teachers must act as guides to the process as opposed to a giver of knowledge.

Another problem revolves around the current No Child Left Behind[9] (NCLB) legislation. NCLB promotes teacher accountability via high test scores while project-based learning promotes a different type of learning: problem solving and critical thinking. Teachers may realize that it is more engaging for their students, but that does not alleviate the pressure to produce high test scores in their classrooms. More research is needed to examine whether project-based learning can actually influence the student's ability to do better on tests. If high test scores are a primary goal of mainstream public education, then memorization might be the most efficient way to produce high scores. On the other hand, if project-based learning motivates students to analyze problems then this approach may be useful in helping students improve their test scores.

Project-based learning has its own unique challenges, however with minimal training teachers can master the approach fairly quickly. The authors believe this method motivates

students to learn more effectively than passive teaching approaches and encourage teachers to experiment with this approach in their own classrooms.

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Notes

1 Project-based learning is a constructivist pedagogy intent on bringing about deep learning by allowing learners to use an inquiry based approach to engage in issues and questions that are real and relevant to their lives. The approach is generally less structured than traditional teacher-led approaches. Students who use project-based learning often organize their own work and manage their own time. Within the project-based learning framework, students collaborate, working together to make sense of what is going on, often constructing their own artifact to represent what is being learned. Project-based learning groups differ from cooperative learning groups. Cooperative learning groups interact in a structured heterogeneous group for the purpose of supporting the learning of the individual and others in the group.

2 Charter schools are publicly funded schools in the United States which have been freed from some of the rules, regulations, and statutes that apply to other public schools, in exchange for some type of accountability for producing certain results which are set forth in each charter school's charter.

3 The small schools movement is a US initiative that contends that many high schools are too large and should be reorganized into smaller, autonomous schools that allow students to receive more individual attention from teachers.

4 EdVisions was created in 1993 and is comprised of teachers and other educational professionals who believe teachers should assume new professional roles and create opportunities for direct involvement in owning and operating various educational entities. The cooperative model allows entrepreneurial educators to create responsive, innovative and efficient educational programs in their own communities. (Website: http://www.edvisions.com/)

5 The Big Picture Company was founded by educators Dennis Littky and Elliot Washor. In 1995, they began collaborating with Rhode Island policy-makers to design a student-centered high school, and created The Big Picture Company as the launching pad for what has now become a national education reform movement. (Website: http://www.bigpicture.org/)

6 Expeditionary Learning Outward Bound is a non-profit school improvement and teacher development organization with a growing national network of 136 schools reaching almost 50,000 students. It has a research-based design built around learning expeditions, other active forms of teaching and learning and a challenging and supportive school culture. (Website: http://www.elob.org/)

7 Middle schools span a period of education between primary education and secondary education. The term 'middle school' may be used as no more than an alternative name for junior high or it may imply a pedagogical shift away from primary and secondary school practices to one that focuses on the developmental needs of middle level students.

8 Exploratory teachers are teachers who teach classes not considered a part of the core curriculum. Exploratory classes allow middle school students the opportunity to explore various interests such as drama, art, informational technology, cooking, photography, industrial technology, etc.

9 The No Child Left Behind Act (NCLB) (Public Law 107–110) is a United States federal law that reauthorizes a number of federal programs that aim to improve the performance of the United States' schools by increasing the standards of accountability for states, school districts, and schools, as well as providing parents more flexibility in choosing which schools their children will attend. NCLB also promotes an increased focus on reading and re-authorizes the Elementary and Secondary Act of 1965 (ESEA). NCLB is the most current federal legislation which enacts the theories of standards-based education reform.

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