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IMPACT OF PBL ON STUDENT CENTRIC LEARNING

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Abstract:

Project Based Learning (PBL) refers to any programmatic or instructional approach that utilizes multifaceted projects as a central organizing strategy for educating students. When engaged in project-based learning, students will typically be assigned a project or series of projects that require them to use diverse skills—such as researching, writing, interviewing, collaborating, or public speaking—to produce various work products, such as research papers, scientific studies, public-policy proposals, multimedia presentations, video documentaries, art installations, or musical and theatrical performances, for example. Unlike many tests, homework assignments, and other more traditional forms of academic coursework, the execution and completion of a project may take several days or weeks or months. This paper, through the reviews of research related to teaching and learning model popularly referred to as "Project-Based Learning" (PBL) shows how PBL develops soft skills and logical thinking of the students, how PBL makes students ready for the next higher level either it can be academic or professional and how PBL helps the student in overall development along with professional progress and practical knowledge. The aim of this paper is to inspire more teachers to become student-centered using PBL in their teaching methods. The review covers six topics: A definition of Project-Based Learning, Characteristics of PBL, The benefits of PBL, Challenges associated with enacting PBL, Research on improving the effectiveness of PBL and Conclusion.

Index Terms: Student Centric Learning & Project Based Learning (PBL)

Introduction:

Project-based learning is a dynamic approach to teaching in which students explore real-world problems and challenges, simultaneously developing cross-curriculum skills while working in small collaborative groups. Project-based learning is filled with active and engaged learning, it inspires students to obtain a deeper knowledge of the subjects they're studying. Research also indicates that students are more likely to retain the knowledge gained through this approach far more readily than through traditional textbook centered learning. In addition, students develop confidence and self-direction as they move through both team-based and independent work.

In the process of completing their projects, students also hone their organizational and research skills, develop better communication with their peers and adults, and often work within their community while seeing the positive effect of their work. Because students are evaluated on the basis of their projects, rather than on the comparatively narrow rubrics defined by exams, essays, and written reports, assessment of project-based work is often more meaningful to them. They quickly see how academic work can connect to real-life issues and may even be inspired to pursue a career or engage in activism that relates to the project they develop.

Students also thrive on the greater flexibility of project learning. In addition to participating in traditional assessment, they might be evaluated on presentations to a community audience they have assiduously prepared for, informative tours of a local historical site based on their recently acquired expertise, or screening of a scripted film they have painstakingly produced.

Project learning is also an effective way to integrate technology into the curriculum. A typical project can easily accommodate computers and the Internet, as well as interactive whiteboards, global-positioning-system (GPS) devices, digital still cameras, video cameras, and associated editing equipment. [2]

This paper is organized as follows. Section II briefs about Project Based Learning and Student Centric Learning, section III details about Characteristics of PBL, section IV briefs about The Benefits of PBL, section V briefs about Challenges associated with enacting PBL, section VI details about Research on Improving the Effectiveness of PBL and this paper has been concluded in section VII by making suggestions on field may best be progressed by future efforts.

Project Based Learning:

What is Project Based Learning: Project Based learning is a systematic teaching method that engages learners in acquiring knowledge and skills through an extended inquiry process structured around complex, relevant questions, carefully designed products, and authentic tasks and skills. [3]

Student Centered Learning: The term student – centered learning refers to a wide variety of educational programs, learning experiences, instructional approaches, and academic-support strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students and groups of students. To accomplish this goal, schools, teachers, guidance counsellors, and other educational specialists may employ a wide variety of educational methods, from modifying assignments and instructional strategies in the classroom to entirely redesigning the ways in which students are grouped and taught in a school. [4] In the traditional approach to college teaching, most class time is spent with the professor lecturing and the students watching and listening. The students work individually on assignments, and cooperation is discouraged. Student centered teaching methods shift the focus of activity from the teacher to the learners. These methods include active learning, in which students solve problems, answer questions, formulate questions of their own, discuss, explain, debate, or brainstorm during class; cooperative learning, in which students work in teams on problems and projects under conditions that assure both positive interdependence and individual accountability; and inductive teaching and learning, in which students are first presented with challenges (questions or problems) and learn the course material in the context of addressing the challenges. Inductive methods include inquiry-based learning, case-based instruction, project-based learning, discovery learning, and just-in-time teaching. Student-centered methods have repeatedly been shown to be superior to the traditional teacher-centered approach to instruction. [5]

Essential Characteristics of PBL:

From Students Perspective:

- ✓ A project that is relevant to my own life and personally meaningful. Completing it requires me to do tasks that really matter.
- ✓ A clearly defined assignment given by the teacher, with little or no input from me.
- ✓ An exploration into an authentic problem. My goal is to solve the problem and present my solution—or a tangible product—to a knowledgeable and interested audience, oftentimes from beyond my classroom.
- ✓ Writing a report or creating an end-product that only the teacher sees and for which I receive a grade.
- ✓ Having a voice in how I investigate the problem, and input on what the final outcome/product should be.

- ✓ Choosing an activity or end-product from a list distributed by my teacher.
- ✓ Doing research by myself only in books or online.
- ✓ A learning strategy that encourages me to regularly evaluate my progress based on my individual work or my participation and contribution to a group's work.
- ✓ Completing my work and handing it in without any self-reflection or analysis.

From Teachers Perspective:

- ✓ A meaningful project that fulfils objectives within a core curriculum.
- ✓ A project that demonstrates what the student has learned AFTER classroom learning or an activity that supplements the classroom learning.
- ✓ A strategy that begins with a driving question that engages students and motivates them to learn the material. The driving question might be stimulated by the teacher and/or the students.
- ✓ Assignments that assess knowledge ALREADY learned.
- ✓ A creative activity designed without specific educational value.
- ✓ A learning process that encourages students to revise their research when necessary and to reflect on their progress throughout the project.
- ✓ A project with a hard deadline that the teacher grades and returns to the student.
- ✓ An evaluation based on a set rubric that assesses student collaboration, participation, in addition to the content.
- ✓ A grading system with a teacher generated rubric.

Benefits of Project-Based Learning:

Project based learning offers a wide range of benefits to both students and teachers. A growing body of academic research supports the use of project-based learning in school to engage students, cut absenteeism, boost cooperative learning skills, and improve academic performance (George Lucas Educational Foundation, 2001). For students, benefits of project-based learning include:

- ✓Increased attendance, growth in self-reliance, and improved attitudes toward learning (Thomas, 2000)
- ✓Academic gains equal to or better than those generated by other models, with students involved in projects taking greater responsibility for their own learning than during more traditional classroom activities (Boaler, 1997; SRI, 2000)
- ✓Opportunities to develop complex skills, such as higher-order thinking, problem-solving, collaborating, and communicating (SRI, 2000)
- ✓Access to a broader range of learning opportunities in the classroom, providing a strategy for engaging culturally diverse learners (Railsback, 2002)

For many students, the appeal of this learning style comes from the authenticity of the experience. Students take on the role and behaviour of those working in a particular discipline. Whether they are making a documentary video about an environmental concern, designing a travel brochure to highlight sites of historical significance in their community, or developing a multimedia presentation about the pros and cons of building a shopping mall, students are engaged in real-world activities that have significance beyond the classroom.

For teachers, additional benefits include enhanced professionalism and collaboration among colleagues, and opportunities to build relationships with students (Thomas, 2000). Additionally, many teachers are pleased to find a model that accommodates diverse learners by introducing a wider range of learning opportunities into the classroom. Teachers find that students who benefit the most from project-based learning tend to be those for whom traditional instructional methods and approaches are not effective (SRI, 2000)

Challenges Associated with Enacting Project-Based Learning:

1. Coming up a Rich Problem: This is a key issue. A "rich" problem has many potential dimensions. For example "How can we make the roads safe around here?", has no simple, cut and dried answers. For example, one reason that kids get knocked over by traffic is that they step out into the road while texting or listening to music. Another reason is that children find it hard to judge the speed and distance of oncoming vehicles. Those are not easy problems to solve. On the other hand, a "problem" like "What's the climate like in New Mexico" can be solved in about two minutes, simply by looking it up.

2. Monitoring who is Doing What: I mean this in two senses. First, you need to ensure that everyone has the opportunity to develop the same skills. Not necessarily in one project, which would be asking a lot, but certainly over the course of the year? Otherwise you could have a situation in which a pupil only ever does writing or design work, and never touches data handling, for example. Think of the individual pupil outcome as a patchwork quilt: it doesn't work if all the squares are the same colour. Second, if one is not careful, it is very easy to allow some pupils to get away with doing very little. However I think one needs to be both pragmatic and perceptive.

- ✓ **Pragmatic:** I once had a class for two hour lessons, twice a week. If I saw a couple of pupils taking a break to discuss last night's soap, I took the view that as I can't work for two hours solid, why should I expect them to be able to? But after a few minutes I'd catch their eye and point to the clock. That was all that was needed.
- ✓ **Perceptive:** Some pupils look like they are not doing any work at all. But just because you can't see their brain whirring doesn't mean that nothing is going on. In one group I had, one boy spent virtually all group discussion time talking about football with his friends on the next table. But every once in a while he would lean over, and make a suggestion. The others invariably followed this new lead, and it was also invariably a brilliant idea. So who is to say he wasn't working, just because he didn't demonstrate it in the usually accepted manner? This, of course, raises another issue arising from PBL….

3. Assessing Accurately: If 5 people are involved in a project, how do you assess each of them on the quality of the outcome? You could decide to simply give them all the same mark. I think that is unfair, or potentially so. I preferred to do three things in this regard**:**

- ✓ Monitor who did what, and keep a written record of that;
- ✓ Have the pupils themselves log what they did at the beginning and end of each lesson;
- ✓ Talk to pupils individually to find out if they really do know what they ought to know if they have done the work they said they had.

4. Monitoring Progress: This is related to assessment, but is not quite the same. What I am referring to is the fact that you need to ensure that each pupil is improving, which entails being challenged. Hopefully, pupils are not doing the same sort of thing in every project, but if they do end up working in the same area twice, the second time should be a development rather than a repetition.

5. Providing Catch up Opportunities: If a pupil misses a particular type of opportunity, how will you ensure that s/he makes up for it? This relates to the points about monitoring: if a pupil has been involved in 4 projects, say, over the course of the year, and has not once touched computer programming in all that time, you may have to tell him what role he is going to take on in the next project.

6. Ensuring No Time is Wasted at the Start of The Lesson: You want the start of the lesson to be dynamic and purposeful. The pupils want that too. What you really don't want is 30 kids all shouting "What do I have to do?". The best way to ensure a proper start of the lesson is to allocate time at the end of each lesson for planning. Pupils should note down the following:

- ✓ What they have done during the lesson;
- ✓ What they need to get on with next lesson;
- ✓ What they need to do between now and then in order to be able to just get on with it as soon as the doors are opened next time.

I have adopted this approach with even the most challenging of classes. It works.

7. Ensuring Quality Learning: There's learning, and there's quality learning. So-called peer learning is not much good if the person you're teamed up with has the same misconceptions or same lack of knowledge as you do. You need to:

- ✓ Monitor what goes on in the lesson, so you can provide timely assistance when required (see next point);
- ✓ Make sure you know who the class experts are, so you can send pupils to them as necessary.
- ✓ Have a set of resources (books, handouts, useful websites) that you can direct kids to when appropriate.

8) Ensuring Nobody Waits Too Long for Assistance: What do you think is an acceptable "wait" time? Personally I believe that 5 minutes is too long. You need to have a range of strategies that you can employ, to ensure pupils are not hanging around waiting for you to answer a question. For example:

- ✓ A rule like "Ask three and then me".
- ✓ Having lots of useful resources for kids to explore for assistance;
- ✓ Clear instructions on the whiteboard, or the wall;
- ✓ Over the long term, establish a classroom culture of "If I can't get on with what I want to do, I'll get on with what I can do.". There is always something useful that a pupil can be getting on with;
- ✓ Having the ability to talk to one person while scanning the rest of the room helps too!

9) Not Minding an Air of Organized Chaos: If a project is something the kids can really get their teeth into, and there is senses of excitement, even urgency, then forget about the idea of a British Library type of atmosphere. It's going to be a bit noisy, and at any one time kids will be walking about getting resources, talking to other pupils or printing stuff out. If that's something you find hard to handle, or difficult to explain to a visiting inspector, then maybe PBL is something you should avoid. [8]

Intervention Research: Improving the Effectiveness of PBL:

An additional strand of research on Project-Based Learning involves attempts to improve the delivery or effectiveness of Project-Based Learning by intervening in the practice of PBL. The intervention may be designed to correct an observed weakness associated with some PBL feature or to remediate or accommodate some student deficiency relative to an aspect of project work. These interventions, which are designed to support Project-Based Learning, have been referred to as scaffolding (Guzdial, 1998) or "procedural facilitation" (Scardamalia, Bereiter, McLean, Swallow, & Woodruff, 1989).

One of the weaknesses of Project-Based Learning, as identified in research on PBL implementation, is that there is often a poor fit between the activities that form the day-to-day tasks of the project and the underlying subject matter concepts that gave

rise to the project (Blumenfeld et al., 1991). Projects sometimes go off track, with teachers and students pursuing questions that are peripheral to the subject matter of interest. The solution, according to Blumenfeld et al. (1991) and Barron et al. (1998) is to find ways for projects to center on "learning appropriate goals." For Blumenfeld et al., an appropriate strategy is to help teachers develop "driving questions," questions that will ensure that students encounter and struggle with complex concepts and principles. Barron et al. take the position that learning appropriate goals can be maintained by introducing explicit design requirements within the problem or project that prompt students to generate and pursue productive questions. [9]

Conclusions:

The research reported above includes a variety of investigations and several important findings. Chief among the findings that might be of interest to practitioners are on

- ✓ The effects of PBL on the quality of students',
- ✓ The challenges faced by teachers and students during PBL implementation,
- ✓ The effects of "procedural facilitation" interventions on students' skill acquisition in PBL.

Keeping in mind that the research to date is fairly sparse in each of the paradigms that have emerged and that this research does not reflect a common model of Project-Based Learning, the following tentative conclusions can be offered.

Research on PBL implementation is largely limited to research on project-based science administered by teachers with limited prior experience with PBL. From this research, there is evidence that PBL is relatively challenging to plan and enact. Keeping the limitations of this research in mind, it is probably fair to say that most teachers will find aspects of PBL planning, management, or assessment fairly challenging and will benefit from a supportive context for PBL administration.

There is some evidence that students have difficulties benefiting from self-directed situations, especially in complex projects. Chief among these difficulties are those associated with initiating inquiry, directing investigations, managing time, and using technology productively. The effectiveness of PBL as an instructional method may depend, to a greater extent than we recognize, on the incorporation of a range of supports to help students learn how to learn.

There is direct and indirect evidence, both from students and teachers, that PBL is a more popular method of instruction than traditional methods. Additionally, students and teachers both believe that PBL is beneficial and effective as an instructional method.

Some studies of PBL report unintended and seemingly beneficial consequences associated with PBL experiences. Among these consequences are enhanced professionalism and collaboration on the part of teachers and increased attendance, self-reliance, and improved attitudes towards learning on the part of students.

PBL seems to be equivalent or slightly better than other models of instruction for producing gains in general academic achievement and for developing lower-level cognitive skills in traditional subject matter areas.

More important, there is some evidence that PBL, in comparison to other instructional methods, has value for enhancing the quality of students' learning in subject matter areas, leading to the tentative claim that learning higher-level cognitive skills via PBL is associated with increased capability on the part of students for applying those learnings in novel, problem solving contexts.

There is ample evidence that PBL is an effective method for teaching students complex processes and procedures such as planning, communicating, problem solving, and decision making, although the studies that demonstrate these findings do not include comparison groups taught by competing methods.

Finally, there is some evidence, albeit indirect, that the effectiveness of PBL is enhanced when it is incorporated into whole-school change efforts.

Directions for Future Research:

Research on PBL has not had a substantial influence on PBL practice. There are a number of reasons for this pattern. First, this research is very recent. The great majority of research reported above has been conducted in the last few years. Even teachers who have recently entered the teaching profession have probably not been exposed to research on PBL, nor would they be expected to have taken courses in the theory and practice of PBL. Second, the research is not readily accessible to teachers or administrators. PBL research, for the most part, has not been presented or even referred to in popular periodicals or in books. Third, there is not a widely accepted framework or theory of PBL upon which professional development might be based. Fourth, much of the research reported above may be irrelevant to the concerns of classroom teachers. Aside from the evaluation studies of Expeditionary Learning, most of the research on PBL emanates from one of three research centers (University of Michigan, Vanderbilt University, and the Illinois Mathematics and Science Academy). This research tends to focus on "packaged" projects, problems, or curricula rather than on teacher-initiated projects or problems. Most practitioners, however, develop their own projects, either on their own or in collaboration with colleagues on site. This teacher-initiated, "grassroots" model for PBL may well be different from those depicted in existing research in subtle but important ways. The disconnection between PBL research and practice is more than just unfortunate. Whereas practitioners in traditional classrooms have access to texts, tests, and other materials, as well as to research-based theories and practices associated with designing lessons, developing materials, presenting content, guiding practice, managing classrooms, and preparing tests, PBL practitioners are in a position of having to construct a unique instructional model almost completely on their own without guidance, texts, resource materials, or support. Lacking information on what PBL practices are most productive, evidence of PBL's relative effectiveness in comparison to other methods, and an overall framework to guide their planning and collaborations, PBL practitioners can be caught in a vulnerable position, unable to justify their practices to critics or to sustain their work long enough to master their craft. What seems to be needed is nothing short of a new theory of learning and instruction, a theory that will provide, on the one hand, principles for guiding authentic inquiry, knowledge construction (vs. transmission), and autonomous learning for students, and, on the other hand, models for designing efficient and productive (standards-based) projects, shifting responsibility to the learner, coaching without directing, and conducting performance-based assessment for teachers.

At the minimum, we need the following kinds of research:

- ✓ Evidence of the effectiveness of PBL in comparison to other methods.
- ✓ Increased research attention on examining the breadth of PBL effects.
- ✓ Research on best practices: Procedures for planning, implementing, and
- ✓ Managing PBL that are associated with student learning and achievement.
- ✓ Research on implementation challenges extended to instances of teacher initiated PBL.

- ✓ Research on the institutionalization of PBL and on PBL-based whole school change.

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