The Need for Project-Related Skills in the 21st Century

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Abstract

This paper critiques the argument that 21st century education needs to include Project-Based Learning (PBL) activities because, when properly structured, they afford learners the opportunity to more independently discover and develop non-academic and academic knowledge and skills in a supportive atmosphere, and thus become more competent and confident as learners and doers. In contrast, increased learner autonomy and attendant smaller teacher roles associated with PBL are discussed as possible barriers for a significant proportion of US learners (& increasingly those of other countries) who often suffer from a lack of self-motivation, which has resulted from a K to College educational system and an abundance of in-and out-of-classroom technology that tends to cosset learners rather than challenge them. It is concluded that while PBL has the potential to produce more independence among some learners, it should be used prudently and overly ambitious expectations about the results should be avoided.

Keywords: Project-Based learning critique; learner autonomy; learner motivation; discovery of knowledge

1. Introduction

Do new generations of learners need project-based skills to thrive in the 21st Century? Much of this issue seems to revolve around the idea of creating or facilitating autonomy in learners so that they can, over the spans of their educational experiences, be increasingly able to intelligently choose what they need to know, and manage the process of learning needed skills. So indeed, one of the project skills children would need to learn—by virtue of this logic—is becoming able to critically think about, develop, and then apply a strategy for learning the knowledge-based skills they need to know to successfully compete in the 21st century. Where is the teacher in all of this? Einstein may have said it best when stating, “I never teach my pupils; I only attempt to provide the conditions in which they can learn” (Critical Thinking
Classes, n.d.). In contrast to Einstein’s approach, I would contend that the traditional lecture method of teaching is too often heavy on teaching facts and details, and rather light on teaching learners how to deal with those facts and details, especially in actual application scenarios, which are clearly a very important realm of societal educational outcomes (Dewey, 1976). In that system it is assumed that a very few learners will be able to go beyond the what (the content) to the how (critical thinking), and that those few are destined to be the ‘leaders’ of society—regardless of the fact that those who are gifted with natural academic critical thinking skills are infrequently gifted as leaders—that one skill is not in fact a pre-requisite for the other. Knowing ‘more’ may be necessary for good leadership, but it is certainly not sufficient. However, there is a worse problem yet with the traditional lecture system in that leadership is assumed to be leadership of other people rather than leadership of oneself in being able to anticipate, plan, design, and execute ‘life’. Thus, it is my position that traditional education has only substantially succeeded in one way—in supporting the hierarchical nature of society, and that this was exacerbated by the Industrial Revolution (roughly 1750 to 1850), which 100 years later contributed heavily towards fomenting a market-based educational system in many countries and certainly toward the related ideas of human capital (Friedman, 1962) and positivism lower case (Halfpenny, 1982). In sum, these theoretical bases promulgated education as a controllable science of investing in human potential, which would result in a highly productive population. In that model, non-cognitive skills such as openness, conscientiousness, extroversion, agreeableness, and neuroticism (sensitiveness) (Levin, 2013) are deemed less important than the more easily measured and manipulated academic problem-solving skills. Thus, any new educational system needs to rationally address the natural and healthy need of all human beings to have control over their own futures (Erikson, 1963), which common sense has demonstrated should include cognitive and non-cognitive skills. More specifically, changing the current educational environment to facilitate conditions under which learners can, with increased autonomy and confidence, acquire the communication, knowledge, critical thinking, work ethic, and the executionary skills to be able to effectively solve personal and societal problems, may be a useful approach for new generations to develop such life-necessary skills if executed in a balanced and realistic manner.

Thus, I would contend that project-related skills are needed in the 21st century to support healthier, more robust, and more pro-active student lives. The educational approach, however, used to optimally facilitate acquisition of such skills is a source of some debate. One recent approach toward instilling 21st century Skills in
learners is called Project-Based Learning (PBL) (Why Project-Based Learning, n.d.), which focuses on learning through well-designed projects that learners perceive as having social, scientific, and/or societal relevance, and where learners, working in groups, contribute as much as possible toward every aspect of the project in question. Teachers in PBL are facilitators and guides.

2. Challenges of Successfully Implementing Project-Related Skills into Education

First, we have a tremendous problem in even beginning to promote the idea of increased life skills autonomy amongst newer generations of young people. (Herein, ‘life skills’ is meant to convey any skill that a person might need to continue to progress in life—be it academic, formal, informal, emotional, communicative, or whatever.) The question is, how does educational culture promote increasingly autonomous acquisition of life skills when the 21st Century is festooned with forces that encourage just exactly the opposite, meaning dependence? The internet has, for instance, created a whole generation of ‘learners’ who ask, ‘why do I have to learn this, I can look it up on the internet?’ Worse yet, what is looked up on the internet are often simple facts and much easier to acquire than associated critical thinking skills and their attendant executionary skills. The historical forces of ‘progressivism’, political correctness, and feminism (Harland & McCready, 2012) that set the foundation for increasingly complacent learners in many countries are also important. In an attempt to make education more inclusive, more fun, and less threatening, these political forces began an earnest attack on the educational system of the US in the late 70s. Unfortunately, the word ‘threatening’ was used to label and expunge—in many educational settings—any aspect of education that might possibly make someone feel inadequate. Thus, competition and comparison—meaning grades or any other evaluation scenario or educationally associated judgment—were essentially neutered in many schools. Beginning about 1990, this educational regime came into full flower, and everything from Physical Education classes where girls might be embarrassed about their bodies, to symbolic mathematics where girls preferred word- or life-problems, to history where learners often failed to see its relevance in modern life—were de-emphasized or removed from k-12 and of course universities as well (Hoff Sommers, 2001). Close enough became good enough in far too many educational environments and too many learners would spend 16 years learning basically one thing—‘you are special’. This American philosophy of minimizing the importance of educational rigor has had ripple effects on educational systems around the world,
where even in South Korea young learners are showing signs of heretofore never
dreamt of academic and behavioral complacency. If learners, therefore, see no value in
learning, for instance, their times tables, then how would they ever develop an interest
in how such a tool (or more complex heuristics) could help them to solve various
kinds of problems or make decisions independent of others’ ideas, products, or
services?

In counterpoint, one might argue that Project-Based Learning (PBL) would
show learners why they need to know how to multiply (or effectively read, spell,
compute, manipulate, experiment, etc.) by contextualizing such a need into practical
problem-solving situations. I don’t necessarily disagree, but at the same time I would
contend that young learners learning a whole group of cognitive, meta-cognitive,
communicative, and executionary skills as a byproduct of doing a project on recycling
does not necessarily translate into being able to apply those same skills to life
problems, which tend to be significantly more complex and rather unscientific in
nature. This is worsened by the inherent contradictory nature of PBL in that it
emphasizes group interactions and cooperation on the one hand, but on the other the
overall goal is to build independent and autonomous thinkers and doers. The
probability is that certainly more learners in such an atmosphere would attain such
skills and eventually generalize those skills to life problems, but there would be still be a wide
range of ‘success’ even within single individuals. Moreover, embedded within the
model of Project-Based Learning is an inescapable judgment as to what constitutes
success in the ‘new order’ of the 21st century. Indeed, we would all be required to
acquire the vaunted meta-cognitive, planning, categorization, communication,
management, leadership, critical thinking, and etc. skills (21st Century Skills Map,
2014; Krathwoh, 2002)—but who will be measuring such acquisition? Undoubtedly,
there is more emphasis in Project-Based Learning on formative and ongoing
assessment of learning (Schwartz et al., 1998). This is appropriate, but as far as
reporting goes, are we stuck with the same old assessment measures, if for no other
reason than true formative testing requires a lot of time? It does seem to be the case
that Project-Based Learning is evaluated using standardized testing (Thomas, 2000),
and that such measures tend to indicate an improvement in basic as well academic
skills. However, standardized testing has for years indicated that learners who do well
on college entrance exams, for instance, would be academically successful at that
level, despite the fact that many university learners who do well on such exams often
possess wanting knowledge, critical thinking, and application skills. Thus, it is not
irrational to conclude that standardized testing accurately predicts nothing more than
learners’ abilities to memorize facts and non-contextualized academic relationships. Thus, by what metric is the new PBL educational system to know that learners have actually acquired sufficient life skills? I am concerned that PBL might conveniently assume—in its zeal to promote human autonomy—that there is some magical threshold of knowledge and skill acquisition over which people cross and then somehow know that they ‘have arrived’. The fact is, however, that many years of study will have to occur in order to determine whether PBL is more effective in improving the life skills of learners as compared to traditional methods.

Another important issue is that of engendering learner motivation for Project-Based Learning. Motivation is like any other human trait in that it falls on a bell-shaped curve. Through starting PBL as early as possible and focusing on autonomous inquiry, it could be argued that this curve could be shifted to the right so that more learners would be motivated to take charge of their own learning, but there is no single educational approach in my opinion that would result in a majority of learners becoming by-and-large independent thinkers and doers. This is not to mention the fact virtually all human characteristics develop at different rates for different children (Bandura, 1986)—sometimes significantly so. I cannot determine how the PBL approach does any better a job at addressing this than traditional modes of education—that is, both address it poorly.

Yet another troubling aspect of Project-Based Learning is its association with ‘progressive education’, which tends to promote the idea that ‘everyone is equal’, which has in turn resulted in too many learners simply disregarding the importance of their teachers in the learning environment and a distinct lack of teacher authority in the last 20 years. Thus, on the one hand PBL portrays teachers as optimally being facilitators and guides for the learner project inquiry process, but on the other sees learners and teachers as essentially being decision-making peers—that is, teachers in an optimal PBL environment will act as a design resource for learners, but not as a driving force. As an example, Patton (2012) in A Teacher’s Guide to Project-Based Learning states that:

Teachers are no longer their learners’ primary sources of information. Instead, they are the designers of learning who created the conditions for the learners to conduct their own enquiries, and advisers to whom learners can come as they create their product. (p. 12)
However, it may be simpler to note that the name of this approach is Project-Based Learning, not project-based teaching (I might have opted for Project-based Education). While I would agree that teachers, teaching, and learning would benefit from an atmosphere of guidance in classrooms rather than one of pedantism, there is no doubt that learners need teachers to be authority figures regarding knowledge, critical thinking, ethics, and behavior in classrooms (VanderStaay et al., 2009)—at least some of the time. Connected to this concern is a vital question about how the education of teachers must change in order to produce educators who are comfortable with the idea of sharing their power in the PBL classroom. While the PBL ethos might paint this as an egalitarian approach to education, the very nature of the traditional teacher describes a person who wants to share his/her hard-won knowledge and perspectives, and values that experience as a part of self-actualization (Maslow, 1998). In my own university teaching practice (of 30 years), I constantly search for ways to imbue learners with the power to control their own learning, thinking, and acting, but this has taken many years of self-reflection and iteration to accomplish. Nonetheless, I still have to balance this approach with being the overall authority figure when necessary. This equilibrium is a very challenging set of skills to learn and requires uncommonly confident and self-reflective educators in practice.

Finally, since PBL puts a premium on technological skills (National Academy Foundation and Pearson Foundation, n.d.), how do educational systems ensure that such skills are upgraded to keep current with 21st Century demands, which are evolving at an ever-increasing rate? Who defines how much technology training is enough? How do educational systems, on the other hand, ensure that technology is used in proper balance with more mundane (but appropriate) tools in Project-Based Learning scenarios?

3. What the ‘Literature’ Indicate

Using the term ‘literature’ in a broad sense to include the internet and actual studies on Project-Based Learning, it is clear that there is considerable bias in support this scheme. It is, however, of concern that the relatively more recent literature seem less critical about PBL. For instance, Summary of Research on Project-Based Learning (2009) is distinctly supportive of PB, whereas Thomas (2000), Brush and Saye (2008), and Barron et al. (1998) review PBL with a more critical approach. In addition, the numerous websites that exist regarding PBL that are distinctly in favor of promoting this approach to education (see BIE, P21, or Vega (2012) in Edutopia),
seem to overlook the question as to why they frequently address the what—the grand scheme with all its supposed advantages—but simply bypass the how—for instance, how teachers indirectly motivate learners to be autonomous and self-directed; how teachers indirectly stimulate ‘leadership’ and self-confidence; how teachers set the conditions under which learners will be motivated by PBL problem-solving topics; how teachers avoid bias in project choice or on what 21st Century skills are prioritized; and how teachers create project-based experiences that involve non-science topics like history, civics, psychology, or social studies. These questions would be challenging in a traditional teacher-centered scenario, but seem positively daunting in the highly learner-centered PBL approach.

4. Summary
4.1 Analysis and Discussion

Two sources regarding PBL may suffice to explicate my main concerns.

The first is from the Summary of Research on PBL (Why Project-Based Learning, n.d.). While it concludes that PBL has a positive impact on: content knowledge; the development of collaboration, critical thinking, and problem solving skills; and on learner motivation and engagement—it also concludes that research indicates that teachers face significant challenges when trying to organize and execute PBL environments, and that learners need significant assistance in project initiation and organization, competent time management, and meaningful use of technology in projects.

The second source is Thomas (2000), who concludes that (my comments appear after each quote):

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. (p. 34)

Comment: It is no surprise that teachers need top-down support to successfully implement PBL, especially given its non-traditional challenges.
There is some evidence that learners 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. (p. 34)

Comment: As discussed above learners do not seem to be as motivated by having significant levels of independence as the PBL philosophy might have us believe.

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 learners learn how to learn. (p. 34)

Comment: Indeed, true education is a 360 degree effort wherein support should take any and all forms necessary to support learner development (Vygotsky, 1978).

There is direct and indirect evidence, both from learners and teachers, that PBL is a more popular method of instruction than traditional methods. Additionally, learners and teachers both believe that PBL is beneficial and effective as an instructional method. (p. 34) Comment: Although a positive sign, the question, however, of whether ‘more popular’ translates into greater life success remains.

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 learners. (p. 34)

Comment: ‘Some’ is not a meaningful indicator of success, however.

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. (p. 34)

Comment: This seems far short of the types of hyperbole found in the media supporting PBL and indicates that traditional systems have merit as well.

More important, there is some evidence that PBL, in comparison to other instructional methods, has value for enhancing the quality of learners'
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 learners for applying those learning in novel, problem solving contexts. (p. 35)

Comment: Although a positive sign, it would be interesting to determine how such enhanced ‘quality of learners’ learning’ was established.

“There is ample evidence that PBL is an effective method for teaching learners 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. (p. 35)

Comment: The query ‘as compared to what?’ has to be applied to the apparent efficacy levels of all new methods of instruction, and is otherwise a meaningless finding.

Finally, there is some evidence, albeit indirect, that the effectiveness of PBL is enhanced when it is incorporated into whole-school change efforts. (p. 35)

Comment: Again, this seems to describe un-contextualized effectiveness, and it is common sense that virtually any reasoned educational approaches would benefit from a whole-school effort.

4.2 Conclusion

Hugo (Histoire d'un Crime) (1877) said, ‘there is nothing so powerful as an idea whose time has come’, and I would add ‘dangerous’ to the current state of the art of Project-Based Learning.

Overall, I conclude that while modern learners would benefit from acquiring knowledge, critical thinking, autonomy, communicative, and executionary skills in an action- or project-based educational environment, Project-Based Learning currently falls short of being a ‘silver bullet’—the main concerns revolving around questionable learner motivation, poorly defined teacher roles, and untested, hyperbolic expectations—as well as dubious social engineering motives.

Project-Based Learning, it seems, is the latest educational technique du jour, and unfortunately like so many other overly-politicized ideas these days, reflects an
extreme point of view. In contrast, enduring man-made or natural structures or even human relationships are often a combination of less flexible and more flexible elements. In engineering and physics this is called a composite structure, which is strong but elastic. Why would we believe that effective educational systems should be mono-chromatic and not composite in nature as well? If children are anything, they are highly variable beings with all sorts of mutable needs, and in essence this means sometimes educating with highly structured aspects of education, teachers, and teaching—and sometimes with very flexible classroom atmospheres. PBL will have to accommodate this, in my opinion, or it will fall by the wayside as so many other monolithic educational approaches have. Nevertheless, I think Project-Based Learning has the potential, in combination with other educational approaches, to provide new generations of learners with the project-related skills necessary for improved self-determination in meeting life’s challenges.
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