Reflections on Teaching

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Failure to learn is a result of exclusion from participation. When students are active participants in the processes of learning rather than passive recipients of transferred knowledge, learning is optimized. [1]

As educators, we are confronted with many areas in which improvement is possible and most often, necessary. In this article I propose that the methodologies of student-led learning and project-based learning can solve many problems faced by school leaders today. These methodologies are the keys to unlocking student's potential by increasing standards, individualizing learning, and improving students attitudes toward learning so they may reach their highest academic potential.

Why Honors Tracks and Special Programming May Not Translate Into Higher Academic Achievement

Many schools today advertise elective classes that require qualification to lure better students with promises of high academic standards. However, for several

reasons these classes are not translating into actual higher learning.

One problem is the teachers' failure to design a different curriculum. Many teachers equate "busy work" with higher learning. Gifted students can learn a curriculum on a deeper level and in a shorter amount of time than average students. Teachers often fill the void by assigning extra work that often leaves students feeling like they are being singled out for punishment. Since the work is not of the students' choosing, it often deflates their motivation and has them regretting that they joined the honor's track.

A second problem with special programming is the administration's lack of commitment to the supplemented programs. Although the school may pay for teachers to be trained to teach the advanced curriculum, the school may not follow up to attain and maintain a supply of resources, space, and staff support to keep the program running effectively.

A third issue with the honors track is that there are few teachers to choose from who are knowledgeable enough with the content of the subject area to successfully design and teach a high-standard curriculum. Even when given the parameters for the curriculum, teachers are uncomfortable with the material and do not understand it well enough to teach it effectively.

Fortunately, even for schools which have no extra funds to allocate to better programming, using the student-led and project-based learning methodologies lead to individualized learning standards and address teachers' lack of knowledge to provide high achieving students with opportunities to reach their potential.

What Are Student-Led and Project-Based Learning?

"PBL is the ongoing act of learning about different subjects simultaneously. This is achieved by guiding students to identify, through research, a real-world problem (local to global), developing its solution using evidence to support the claim, and presenting the solution through a multimedia approach based in a set of 21st-century tools."[2]

Practically speaking, project-based learning is a way of learning that requires the student to be fully engaged in the identification of a question or problem, and to design, plan, and implement a solution to that problem.

In project-based learning, students choose a particular project of their own design to be completed over the course of a day, a week, or even a semester. During that time students are planning, researching, and presenting their findings and

their project proposals to the class. Using rubrics and a timeline for estimated project milestones, teachers and students can verify the time to complete their projects, and teachers have a way to continually assess students' progress and provide feedback.
Student-led learning supports student choice in how they learn objectives. The educational facilitator (teacher) introduces a concept and briefly explains it. The student then sets about modeling the concept to achieve a more thorough understanding. Using technology to research and present their findings, students become engaged in their learning employing means they are most comfortable with and gain deeper insight into concepts than offered by lecturing alone.
"Rather than helping students develop an ability to memorize facts in a textbook, teachers should teach students metacognitive and self-evaluative skills, so they can assess what they need to learn in order to solve a problem or complete a project." [3]

In a typical engineering class, we begin with a 10-minute introduction to a concept. After explaining the general principal, the class is turned over to the students for student-led learning and inquiry. Working in teams of two to four, students run a simulation and use that activity to generate values of certain units. Using the students' measured values, mathematical and scientific theories or equations are discovered based on actual measurements.

Ideally, these classes are two periods long as set up and clean up can take up the bulk of time in a 45-minute lesson; however, with modifications to the lab activities, 45-minute periods can be manageable.

Due to the demands of the teacher and the action going on in the room, the learning is best suited to classes ideally limited to 16 students, at most 20, to one educational facilitator.

How Student-Led and Project-Based Learning Address All Skill Levels

The open-ended inquiry and learning is not limited to the highest achieving students or to science subjects. The issue is about its presentation and method of study, not about content. Even if a teacher is less well versed in a content area, the student-led approach to learning allows the teacher to become the educational facilitator, not the stereotypical omniscient lecturer. If a student has a question beyond the teacher's ken, the student can research the question and write up a small report on the matter for extra points. Student efforts notwithstanding, the teacher should always look up any questions to continually grow in knowledge and have the ability to address and guide students.

Let us use a typical high school Talmud class, to show how the student-led approach may be implemented. In my experience and observations, there was a teacher at the front of the room reading the page and translating while students jotted down definitions to archaic words to try to keep up with the flow of discussion.

In our student-led class the teacher would begin with a short introduction (five to seven minutes) of the topic and brief summary of the discussion.

Next, students could be divided into small groups with a team leader of their choice. Each group would be assigned a section or discussion of a particular topic. The group can self-assign tasks for each individual; one looks up definition of words, one researches the time period to put the discussion into historical context, another student researches the rabbis in the discussion and examples of their general trend of opinions (strict versus lenient), one student is responsible for compiling the information into a slide presentation, and so on. The teacher remains in the room as educational facilitator, guiding and encouraging each group of students, making sure they are on task and focused, all the while reminding them they will be required to present their findings to the class.

Eventually, the groups would present their finding to the class. On that occasion, a department head or other administrator the students consider important would be invited to witness the efforts and success of the students. Informing the students in advance that this person will be invited encourages them to do their best. Once all of the presentations have been given, the teacher could pull all of the ideas together in comprehensive discussions to review the material and prepare students for an exam.

In the scenario above, the students are motivated to show up to class on time so as not to miss the most important part they cannot make up, the teacher’s introduction. Throughout the class students are fully engaged in the material they are learning, rather than being taught and passively absorbing the information. They have a vested interest in the rabbis’ 1,000-year-old discussion through their eyes as students as well as Jews. A subject that is usually deemed by today’s students as irrelevant and difficult to follow, unless watered down and taught at a snail’s pace, is now a dynamic and exciting endeavor in which history is brought to life.

There are many possible variations of the Talmud class example. One such idea is a grade-wide assembly of presentations in which parents may be invited to see their children’s learning and appreciate the opportunities the school gives them to

shine and rise to a challenge.

How Student-Led and Project-Based Learning Increase Educational Standards

Despite my years of work preparing for my master’s in education and my years of teaching, I had barely been exposed to the student-led and project-based learning methodology.

Six years ago I was trained over a few week period to teach engineering to high school students. The class structure was organized into two parts: one-quarter part instruction, three-quarters part modeling the concept. This was a drastic change from how I was accustomed to learning and teaching.

Today, most learning follows the traditional method in which students copy down what the teacher says and memorize the material for assessments. Very little applicable knowledge is gained, and therefore, what is learned is easily forgotten. There is little room for student-led learning and this passive learning increases as the student progresses through the grades. [4]

Referring to Bloom’s taxonomy, a pyramid of educational goals organized to show the simplest form of learning on the bottom, and increased learning as you go up the pyramid, we can see that traditional learning satisfies at most, the two lowest forms of learning, remembering and understanding. With only lecturing and following pre-planned activities, student learning is limited. By employing student inquiry, student-led and project-based learning, the acts of applying, analyzing, evaluating, and creating are carried out by students to achieve the highest forms of learning.

Teachers in an honors classes could use the extra time to do modeling and hands on projects with students, use special equipment, and promote student-led research and learning. Specific examples of these concepts in a science course are encouraged use of microscopes; research of a particular topic and class presentation of their findings; student modeling of scientific principles such as force or magnetism as it relates to electricity; development of an engineering project, a unique computer program, or web design.

It is up to the teacher to decide how much of class time is dedicated to student-led and project-based learning. Depending on the subject and the level of experience with these methodologies, teachers can divide class time accordingly between their preferred or necessary mode of educating and the student-led approach. Additionally, much of the project-based learning can be assigned outside of class leaving more time for traditional learning in the classroom.

Research and modeling are not limited to science classes. Students are surprisingly creative in formulating ideas to express a theory, concept or theme. Giving students the opportunities to explore a topic and present their findings in a manner of their own design, using today's technology helps ensure students' engagement, enthusiasm, and deeper understanding.

How to Turn Student Familiarity into Your Advantage

In today's world, familiarity between teacher and student is more prevalent, and respect is secondary. However, there are advantages to this trend. A significant factor that can lead to a student's success is the bond of friendship that the teacher can forge with his students.

It takes a fair amount of energy on the educational facilitator's part to be aware of what his or her class is doing; all different things, in the same room, at the same time. However, the payback for student and teacher is tremendous. While student-led learning is going on, there is an opportunity for the teacher to express his or her belief in the student's potential.

The most important thing the teacher can do is to continually encourage his students. In doing so, there is an avenue for teachers to express respect for students and understanding for their needs. In this way teachers have an easier time developing mutualistic relationships in which both teacher and student benefit. Teachers willing to take into account a student's difficult circumstance or a conflict in responsibilities and adjust a test date or assignment due date are viewed as partners for whom the students will work harder not to disappoint.

This is not to say teachers should present themselves as pushovers. Generally, teachers need to remain caring but firm. However, when extenuating circumstances present themselves, teachers, like any person in a position of power, can put himself in the student's shoes and, within reason, try to accommodate his or her needs.

Rigid teachers who demand respect and remain familiarly distanced from students will ultimately find less respectful, less willing, and less engaged students in the classroom. While this information seems self-evident, it is more common in practice. Those very teachers who are inflexible will often deny being so and see themselves as appreciated by students despite the reality to the contrary.

In an environment of mutual regard and consideration, students develop a greater respect for the teacher and themselves, at a time in their lives when they

need it most. Moreover, students gain the confidence and experience they need as young adults to plan ahead and stay the course to achieve a goal.

Student inquiry and project-based learning are applicable in all subject areas and can be implemented by all teachers without requiring significant content-area knowledge or experience. Students with varying skill levels can utilize many different methods to accomplish the tasks of researching, organizing, and presenting information.
Additionally, the usage of technological resources and programs to accomplish these tasks become part of students' skill set not limited to his academic career. The potential for learning in these settings is very high as the students are challenging themselves and pushed to their greatest abilities as seen fit by the educator to design, research, and carry out their own ideas as they relate to learning.

[1] Beloff Farrell, Jill. "Active Learning: Theories and Research." Jewish Education Leadership, Volume 7:3, Summer, 2009.
[2] Wolpert-Gawron, Heather. "What the Heck Is Project-Based Learning?" Edutopia. January 26, 2015. Downloaded December 11, 2015.
[3] Checkley, Kathy. Student-Directed Learning. Education Update. Volume 37, Number 9 December 1995. Dowmloaded December 15, 2015.
[4] Exline, Joe. "Concepts to Classrooms," WNET Education 2004. Educational Broadcasting Corporation. http://www.thirteen.org/edonline/concept2class/inquiry/index.html. Downloaded December 10, 2015.