

Teachers instinctively know that projects are worthwhile, even if they do not understand every facet of a good project or have experience supporting projectbased learning. For too many students, the term "project" means any activity that is not worksheet-based or takes longer than a 42-minute class period. I have seen too many instances of unimaginative assignments turned into projects just by giving students weeks for completion. That five paragraph essay about caribou is transformed into a project when students are given two months to obsess over it. The inevitable procrastination leads to increased stress and an imperceptible improvement in quality.

The protean nature of computers as constructive material with which you may explore powerful ideas and express yourself in a myriad of ways makes a wider range and depth of projects possible like never before. The Constructivist Consortium is committed to using computers in creative ways in which interdisciplinary projects demonstrate student competence and connect knowledge domains. Open-ended software supports learning diversity and allows multiple entry points into a sea of ideas. Seymour Papert once said, "If you can make things with computers, then you can make a lot more interesting things."

Making things is better than being passive, but making good things is better still!

The Constructivist Consortium believes in Papert's theory of

constructionism; the idea that the best way to construct knowledge, or understanding, is through the construction of something shareable, outside of a student's head. Those artifacts are commonly thought of as projects, even though the project development process is where the learning occurs. Such artifacts are evidence of learning.

Elements of a good project

Purpose and Relevance. Is the project personally meaningful? Does the project prompt intrigue in the learner enough to have him or her invest time, effort, and creativity in the development of the project?

Time. Sufficient time must be provided for learners to think about, plan, execute, debug, change course, expand, and edit their projects. Class time affords students equal access to expertise and materials; projects may also need sufficient out-of-school time.



Complexity. The best projects combine multiple subject areas and call upon the prior knowledge and expertise of each student. Best of all, serendipitous insights and connections to big ideas lead to the greatest payoff for learners.

Intensity. Children have a remarkable capacity for intensity that is rarely tapped by the sliced-and-diced curriculum. Projects provide an outlet for the exercise of that intensity. Think about how long kids can spend mastering a video game, reading a favorite book series, memorizing the attributes of Pokemon, or building a tree house, and you have a good template for successful project-based learning.

Connected. During great projects students are connected to each other, experts, multiple subject areas, powerful ideas, and the world via the Web. The lessons learned during interpersonal connections that are required by collaborative projects last a lifetime.

While there is some merit in organizing student groups to "teach" collaboration, I prefer a more natural environment in which students collaborate (or do not) based on their own needs.

Collaboration may consist of observing a peer, asking a quick question, or by working with the same teammates for the duration of a project.

Access. Students need access to a wide variety of concrete and digital materials anytime, anyplace. Personal student laptops make this possible, but we also need to think about the quality and quantity of craft materials, books, tools, hardware, software, and Internet access that allows learners to follow paths we may never have anticipated.

When nonconsumable materials are used, such as LEGO, a sufficient quantity is necessary to ensure that students have everything they need for their projects and can leave the finished products together long enough for others to learn from them. The last thing you want is one student cannibalizing a classmate's work during project creation.

Shareable. This is the big idea of project-based learning! Students need to make something that is shareable with others. This provides a great deal of motivation, relevance, perspective making, reciprocal learning, and an authentic audience for the project.

"A project is something you want to share" is a sufficient definition for learners of all ages.

Novelty. Few project ideas are so profound that every child needs to engage in its development in every class, or year after year. Yes, that means that it may be time to rethink the annual marshmallow adobe project. If one student makes a fantastic discovery during a project, others can learn from it without slavishly repeating the steps of the pioneering student. In a healthy community of practice, learning continues and knowledge is shared naturally without coerced repetition.

Questions Worth Asking

Is the problem solvable? Projects often begin with a problem statement. Too many school projects are based on problems unsolvable by students. That is not always a bad thing, since a student might learn a lot before appreciating the enormity and complexity of a problem. That is a worthy outcome in itself. Completely solving a problem about fixing a levee may be too advanced for Kindergartners, but they could learn the complexity of the problem and gain an appreciation for the other

things they need to learn. Asking kids to solve world peace is a dopey project idea because they can not get their heads or arms around such ill-defined, infinitely complex problems.

Requiring students to assume the role of people with whom they share no life experience causes other problems. This is why conference panel discussions asking school students to invent the future of education leads to a stream of banalities and audience boredom.



The brilliant educators of Reggio Emilia, Italy, teach us that a welldesigned, open-ended, learner-definable prompt is the best starting place for project-based learning. Rather than ask, "How would you make the world a better place?" Reggio educators might ask three year olds, "Can you make a park for the birds who come to visit our school?" Kids immediately have a starting point they can wrap their heads around. They know about birds and parks and can build all sorts of representations. In the process they learn about birds, measurement, engineering, and collaboration and develop a plethora of powerful ideas no teacher is smart enough to anticipate.

Is the project monumental or substantial? Schools require kids to produce all sorts of monumental work, like that work sheet featuring 200 similar arithmetic problems. The goal is substantial work, where a student wants to engage and may exceed our expectations. The goal of school should be for students to engage in substantial work.

Who does the project satisfy? Is the learner as enthusiastic a beneficiary of the project as the person giving her a grade? Great projects benefit the learner more than the teacher.

What can they do with that? Seymour Papert taught me that anything you ask of a student should lead to the construction of a more complex question or a larger theory. Otherwise, we should rethink the assignment. Great projects, like hobbies, have a selfregulating feedback loop. Incremental success motivates a student to try something more ambitious or to enhance the project. Bugs or mistakes lead students to rethink problems and test new strategies. Powerful learning occurs in both instances.

Making Memories

Ever woken up late on a Saturday morning and realized that you have no milk for your coffee? You pull a coat over your pajamas, put on a hat, and run to the local Kwickie Mart. Just as you are leaving the store unrecognized, a former student sees you from across the parking lot. She comes rushing towards you and your unbrushed teeth with arms outspread and gives you an awkward hug. The former student wants to reminisce. She enthusiastically begins a sentence, "Remember that time we..." The rest of the sentence is never "crammed for the standardized test" or "used all of our spelling words in one big stupid sentence." The student's reminiscence always concludes with a description of a project.

Projects are what students remember long after the bell rings. Great teachers know that their highest calling is to make memories.



Gary Stager, Ph.D.

Biography

Gary Stager has spent the past twenty-six years as an internationally recognized educator; speaker, and consultant. He is the Executive Director of the Constructivist Consortium.

Raising Our **Standards**

Developing projects that endure



projects is a powerful way to do so.

Stert Regulas

Projects create memories for students. Those memories contain the skills and content learned during that projects development. The best teachers are those who inspire memories in their students, and engaging students in great

Raising the bar

In this age of higher, tougher, meaner academic standards, any classroom practice associated with creativity is susceptible to caricature. Constructivist educators struggle with the perception that our kids can't possibly compete with their peers in India or China when engaged in project-based learning. It is imperative for constructivist educators, therefore, to raise the bar, challenging their students to achieve a high standard of quality. The value of student projects at all levels needs to be demonstrably obvious even to the most casual observer.

My last article detailed the elements found in great projects, but even when those elements are present, I fear that our standards are sometimes too low.

All too often, we are enchanted by the technical merit of a project and forget the importance of relevance, meaning, and sufficient evidence of understanding. Adults are often quick to celebrate students' success with technology and neglect to consider the overall impact of student project work.

This verbal inflation, a phrase coined by Seymour Papert, may result from a fear of computers, a lack of imagination, or a shortage of technological fluency. Rather than concentrating on purpose, relevance, sufficient time, complexity, connections, access, shareability, and novelty, we are distracted by the technology, and the project suffers for it. A powerful project inspires student memories because of the learning that takes place during its creation, not because a student

successfully navigates the technical vagaries of the software used during its creation.

An artisan's aesthetic

Artists, musicians, filmmakers, authors, poets, crafts people do not set out to produce or consume content. They work tirelessly to draw, write, paint, film, compose, play, build, knit, sew, act, or direct to create personally meaningful objects, sights, sounds or memories. In the rare instance, others will value such personal expression.

I suggest that educators plan and evaluate student projects based on a loftier set of goals. Teachers should embrace the aesthetic of an artist or critic and create opportunities for project development that strive to satisfy the following criteria.

Is the project:

- Beautiful
- Thoughtful
- · Personally meaningful
- Sophisticated
- Shareable with a respect for the audience
- Moving
- Enduring

That last variable is the highest standard of all. Does the student project have a chance of enduring? Will it make a contribution to knowledge or be a source of student pride? Will a parent frame the work or preserve it in a scrapbook? Artists have no idea if their creation will endure, but that is their aspiration. Should student projects aim for less?

Think about the sorts of projects that parents love and cherish. The best projects endure in the minds of students and on their parents' refrigerator door.

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Genius of Print

Beauty and the value of paper

By Gary Stager

Making things provides a powerful context for learning. An authentic, or real-world, audience for one's work is a mighty motivator. As teachers, we often promote the idea that process is more important than the end product, yet it is often the product itself that provides context and motivates students to learn. Knowledge is a consequence of experience, and open-ended creativity tools expand opportunities for such knowledge construction.

Emphasizing the process—the "doing" part of project work—should not cause us to lower our expectations for the final product. Sometimes we overlook shortcomings in a final product because the result is... well... cute. While cuteness may be a desirable attribute of student projects, *good* is even more desirable–and there is no reason why student products cannot be both cute **and** good. Interesting, timely, relevant, sophisticated, moving,



whimsical, charming, thoughtful, original, clever, imaginative, and innovative are all attributes that contribute to a *good* project.

While every project may not generate an objet d'art, we should assume that every project we undertake has the *potential* to do so. We must operate from a perspective that children are competent, talented, and capable.

Whatcha Gonna Make?

The advent of the personal computer 30 years ago was greeted by the metaphor of "computer as tool." Seymour Papert, who worked with renowned educational theorist Piaget, combines the constructivist idea that learning is an active process with the research-backed concept that learning happens most effectively when people actively make things in the real world. He calls this idea "constructionism." Papert refers to the computer as a raw material with which you can make all sorts of things. Papert believes, like many of us, that the construction of shareable artifacts-a poem, a robot, a computer program, a musical composition-is an effective way of ensuring the construction of mental models.

More so today than ever before, it is clear that many forms of student work

live only on the computer screen. Computer graphics, digital storytelling, movies, animations, simulations, and video games are all screen-based. Many educators have embraced this technology fully and in many computer labs and technology-rich classrooms this aesthetic transition is in full bloom. But wait! Let's not forget the value of paper!

Ah, Paper

I was reminded of the power of paper during my recent study trip in Reggio Emilia, Italy. Teachers there investigate the thinking of children by meticulously documenting what students do and say while engaged in projects and social interactions. Some of these "learning stories" are memorialized in absolutely gorgeous books—not eBooks, but good oldfashioned paper ones.

Web pages, podcasts, PDFs, and YouTube videos are great ways to share student work, especially when a project is enhanced by digital publication, but paper is timeless. Paper-based student work can become a family heirloom and be cherished for generations. Some tools, like Pixie, are equally suited for sharing work either way, allowing students to publish work as podcasts or online storybooks as well as printing greeting cards, booklets and graphic novels.

One of the most exciting revolutions in printing since the invention of movable





type is happening right now: print-ondemand. iPhoto can be used to generate spectacular books chronicling a project's development or life in your classroom. Sites like Blurb.com and Createspace.com make it easy for you or your students to create books-ondemand. Countless web sites will turn your art into a wide array of learning memorabilia. For students who have a large body of written work, there is an ever-growing array of "vanity press" sites where they can create, publish, and print books on demand.

Students might write more and with greater care if their work resulted in an actual book. The transcribed story of a pre-writer could become the first book a fledgling author reads to her proud parents. The teddy bear poems or collection of Nana's recipes takes on greater resonance as it metamorphizes from homework chore to beautiful book.

As I've written in previous articles, one of the noblest goals of education is to create memories. Beautiful paper books created by children add permanence to such memories and can last a lifetime.

Biography



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Gary Stager has spent the past 26 years as an internationally recognized educator; speaker; and consultant. He is the Executive Director of the Constructivist Consortium.

Curriculum Connection

Technology as a motivator and equalizer



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"In my role as a Teacher Specialist for Instructional Technology, I have the opportunity to co-plan and co-teach with teachers across grade levels and subject areas to integrate technology into their lessons. A fifth-grade teacher recently approached me to brainstorm ideas for her reading groups, ranging from special needs to above grade level students. Since each child was currently working on a self-selected mystery book, I immediately thought of using Pixie to showcase their individual book choices!

On the day of the lesson, I discovered that the students were new to Pixie. After a few simple directions, the kids were off and running on their own. You could have heard a pin drop as the children were consumed with creating trading cards about their books. They absolutely loved every minute of it! One child was pleasantly surprised to discover the drawing tools in Pixie allowed her to illustrate even better than when she uses paper and pencil. Meanwhile, I couldn't tell who had special needs and who was above grade level. All of the students were engaged, enthusiastic, and excited!

When everyone was finished, we printed the trading cards in color so the children could exchange them to receive a full set. The excitement buzzed through the classroom as the kids received their color cards to trade. Some children went as far as to put their trading cards in plastic protectors!

A mother of a high-functioning autistic student in the class approached me about a week after the lesson to share that her child was so engaged with the trading cards that he would read them over and over again at home. He carried them everywhere he went and proudly flashed them at others as he proclaimed, 'Look what we did on Pixie! I know Pixie! Do you know Pixie?' When asked what he likes best about Pixie, he responded, 'You can create things and use your imagination. It's awesome!' His mother shared with me that it can be difficult to keep his attention long enough to engage him throughout a lesson. Technology was the key to helping this student achieve success in a regular classroom environment.

The students who were above grade level added their special touches to their trading cards and were just as excited as the rest of their peers. 'I had such a great time making the trading cards,' commented Jillian. 'It was fun!' Technology was the great equalizer for this fifth-grade class!"

> Luna Lovegood Harry Potter and the Deathly Hallows



Traits: Quirky, dreamy, good friend Quote: " It's the horn of a Crumple-Horned Snorkack!"

ary: Voldemort is becoming stronger each day, taking over Hogwarts and the Ministry of Magic. Harry and his friends continue to search for Voldemort's Horcruxes so that they can destroy Voldemort. There is a huge battle at Hogwarts between good and evil. To find out who wins the battle whether or not Voldemort is destroyed, read this book!





anted a safer and a happier place for impy v him and his family to live. But there is a highwa and a lot of humans on the way. It would be very dangerous and a long trip for a bunch of toads. Some how he finds this toad heaven, but how does he get to his whole family to tell them about it when they might be all the way across the world by now? Find out in this book <u>Toad</u> Heaven