

## A Guide for School Leaders

# Minimally-Invasive IT



*Gary's first "computer labs" in a horse trailer with an outdoor porch in 1983*

**M**y New Jersey public school district had terminals connected to a timeshare mainframe in classrooms before the Beatles set foot in America.

I learned to program around 1975 in a class required of every 7<sup>th</sup> grader. That experience was life-changing. For the first time ever, I felt smart, competent, and creative. We challenged one another, taught one another, and were on fire to learn thanks to the inspiration of Mr. Jones, a teacher who had to be learning to program computers slightly ahead of us since no PD or "Hour of Code" existed in the mid-1970s. Because we did not know what was impossible, we thought anything was possible. It was several years before I encountered a piece of software created by someone I did not know.

By 1977, I was a 9<sup>th</sup> grade systems operator of a multi-district mainframe with keys to the office, a secretary who would take phone messages for me, and access to the notebook in which passwords were handwritten. In 1982, I created one of the first computer programming camp programs for kids. I've been online since Ronald Reagan's first term and designed one of the first online graduate degree programs for educators at Pepperdine University in 1997.



*Photo from one of the earliest 1:1 "laptop schools" in the early 1990s*

I led professional development in the world's first 1:1 "laptop" schools back in 1990 and was part of the One Laptop Per Child ("\$100 laptop") Learning Team deploying personal computers in developing nations. My doctoral research was based on creating a project-based, multiage, alternative learning environment inside a troubled prison for teens where each student had their own personal computer resulting in zero repairs over nearly four years. The book I co-authored, *Invent to Learn – Making, Tinkering, and Engineering in the Classroom*, played a major role in the development of maker spaces in schools.

This is all a way of saying; I have been around children and computers for a very long time. My experience has led to high expectations for how computers and computing should be embraced as an intellectual laboratory and vehicle for self-expression. While some people may be excited by using computers to surveil, enforce compliance, or

teach the same old stuff with greater efficiency, my work is rooted in the knowledge that computing creates opportunities to learn and do in ways that were unimaginable just a few years ago. Our primary responsibility as educators and paraprofessionals is to introduce children to things they don't yet know they love and to do everything within our power to amplify the potential of each member of our community.

## I've seen it all

My work has taken me to schools and classrooms on six continents, I have experienced the best and worst "IT" implementations. Living through the misguided hype and hysteria associated with "Don't copy that floppy," lost mouse balls, "smart" boards, tinfoil hats to protect against Wi-Fi, worthless tech standards, keyboarding instruction, drill and practice, gamification, cellphone bans, bitmoji classrooms, and now AI, I find solace in the wisdom of the great philosopher Pee-Wee Herman. "Chillax!" They're just computers!

## Recommendations

I want the best for the students you serve and humbly offer this modest advice in that spirit.

### **Differentiate**

Just as there are profound differences between teaching and learning, it behooves us to make clear distinctions between "instructional" and "non-instructional" computing. 2nd grade haiku files do not require the same level of security or management as health or financial records. In essence, school IT Departments are engaged in two different businesses.

### **They call it a PC for a reason**

They are supposed to be personal computers and are everywhere, but school. It's time to reassert the personal nature of computing for lots of reasons.

We knew we were amid an important paradigm shift when students in the first "laptop schools" began decorating their laptops with stickers and writing their names on them with glitter pens.

When the computer is personal, students assume ownership of the technology and the work created within it. They learn more, become more self-reliant, and solve their own problems. Kids manage their files instead of relying on some god-like force in the IT Department. The cost of IT support goes way down. In fact, the first school with more than 1,000 personal laptops employed one person to look after the computers, an older

woman named Louise, who would pat you on the head in the unlikely event your computer was broken and call the dealer to have it repaired (usually within 24 hours).

Appropriation applies to teachers too. The number of teachers who in 2023 still cannot locate their files or use a trackpad is conclusive evidence that a culture of IT dependency benefits no one.



## Be a lifeguard, not a commando

Your mission is safety, not law enforcement, sting operations, or fighting enemy combatants in classrooms.

## Kids are indispensable partners

Forty years ago, colleagues taught high school kids to perform Apple and IBM certified repairs for the majority of school districts in North Jersey. For decades, Dennis Harper's Generation YES demonstrated how students may play vital roles in tech support, front-line troubleshooting, peer teaching, and leading professional development for their teachers. Kids should be embraced as colleagues and allies, not customers or enemies of the enterprise.

## Heaven is not in the cloud

The cloud is swell and often better in theory than in practice. Saving a few bucks by buying Chromebooks instead of laptops seems less prudent when you include the cost of increased bandwidth, extra IT personnel, bugger performance, user confusion, and frustration. The cloud may in fact be the future, but in too many schools today it feels like 1970s timesharing.

## Don't be a cheapskate!

Spend a few extra bucks on the better computer or longer-lasting battery. Always buy an extended warranty for personal computers. We are the richest nation in the history of history. We can afford a laptop and cello for every kid.

## Be a cheapskate!

Is there a less expensive way of solving a problem or providing a service? A lower-cost, even single-purpose tool, may do the job quite sufficiently and allow for greater access. Will five more affordable 3D printers be a better investment than relying on a "good" one that costs five times the price?



*Photo from one of the world's first 1:1 "laptop schools" in 1990. Gary worked with those schools.*

I led schools where there was no server attached to student computers. In fact, each MacBook had a number written on its bottom in Sharpie. If you wanted to find your file, locate the computer you used, and voila! There's your work. This model was successful for years.

Participants in my Constructing Modern Knowledge summer institute share project videos, large and small, by using one \$500/year account. Users can upload from anywhere, anytime, and from any device with compression done on the fly. Everyone uses the same username and password. The community self-polices, and you may control whether the content is public or not. Compare this ease-of-use and functionality with the cost of maintaining on-site media servers. Outsourcing some services to external software may be prudent and cost-efficient.

## Let the kids go rogue

Every member of your school community, including young children, require email access, web space, and perhaps even a domain of one's own (<https://www.wired.com/insights/2012/07/a-domain-of-ones-own/>). Let kids build their own "walled garden" network, assemble their own computers, and have access to their own printer(s). They will learn a lot, gain agency, enforce safe practices, and get more work done.

## If you made it, you can play it

Schools are perennially flustered by the question of "games in the classroom." My rule has always been, you can play any game you programmed. There are a ton of things one can learn by programming games and the fact that the technology now exists for carrying those games on pocket devices or installed in lunchroom arcade cabinets is quite exciting.

## Enable, don't disable

If I may be so bold, the job of IT is to support the aspirations of students and teachers. This is best achieved by enabling, not creating unnecessary hurdles. I often find that computers work better out of the box than after an IT department is done fiddling with them.

## K.I.S.S.

Not the band – keep things simple! Do you really need that 37 character alphanumeric password for kindergartners. Is that rule necessary? Are we making more work for ourselves, teachers, or students? When you make simple things easy to do, you make complexity possible.



## Creation > Consumption

Creators add value and learn more. Consumption is passive and leads to less knowledge construction. Favor creation over consumption.

## Make computing invaluable

When the act of computing – creating, thinking, making, controlling, collaborating, and designing are invaluable to users, including kids, they will take better care of the hardware, software, and infrastructure and develop more pride in their efforts.

## Yes > No

Find a path to say “yes.” Support the hopes, dreams, and aspirations of your school community. Introduce incredible technology that folks may not yet be aware of. There is much greater job satisfaction and associated with being a positive force within your organization. The American School of Bombay is one example of an IT Department that took great pride in providing concierge-level service. They performed their jobs with a smile and could seemingly solve any problem with great enthusiasm and an open heart. Such a disposition and leadership style makes everything about a school better.

## Enforce laws that actually exist, not imaginary ones

Yes, there are laws governing privacy, data security, and computer use – many fewer than the behavior of some schools might lead you to believe. Many of the oppressive policies governing Internet use, networking, and project sharing are mere fantasies concocted to cede power to those enforcing them or to calm worrywarts. I have literally visited schools with a state’s edtech director and listened to school personnel argue that they are required to enforce rules and regulations that the person responsible for such policies just told them don’t exist.

## Bad teaching leads to maintenance issues

I can tell the quality of teaching or level of creativity found in a school by looking at the state of the computer hardware. Broken keys, grime, and cracked screens are indicators of poor instruction, drill and practice, and associating computers with unpleasant tasks.



## **Scarcity is a major impediment to use**

When access is too limited, use will be much lower than desirable. I discovered decades ago that girls stop competing for a few minutes of computer time by about fourth grade. It is not hard to imagine that underserved students and teachers find scarcity just not worth the bother.

## **They're just not that into you!**

The best IT is invisible IT. Be like the Maytag repair man. (Google it youngsters.)

## **Set it and forget it**

When you renovate a kitchen or install plumbing, you don't wake up every morning forever to find the plumber sitting in your house. Is there a reason why so many people are maintaining your network or computers? Does false complexity create this need?

## **Sharing is a critical function of learning.**

It breaks my heart to observe that the most popular and frequent question asked on forums for using Scratch in the classroom is from educators seeking a way to disable project sharing. That is the entire *raison d'être* of Scratch. Humans are social beings and sharing is a powerful way to learn. Kids and teachers need to share. Technology should make sharing frictionless.

Legislation governing "privacy" disproportionately benefits large corporations with the legal muscle to comply with onerous laws. It is unconscionable that large expensive systems that drill, test, surveil, or rat on kids pass privacy muster when obviously constructive software, like Scratch, are implied to be a threat.

## **If it ain't broke, don't break it!**

A school employs a computer science teacher and the curriculum tells them to teach machine learning. The activity requires training software to recognize images via the computer's camera. Students have Chromebooks, but the IT department has disabled the cameras for some unknown reason. This causes the teacher to invest all sorts of extra time and energy MacGyvering a Rube Goldberg way of simulating the process, thereby denying students the hands-on experience they deserve. Could this be why teachers are reluctant to teach with computers?

## **Enough with the cheating hysteria!**

Seymour Papert once said, "Everyone needs a prosthetic." Lots of us wear eyeglasses, yet no one accuses us of cheating. We use "technology" all the time to go about our daily lives. We should find constructive ways to embrace emerging technology while ignoring toys, fads, and distracting conflicts. The goal of education is not to test kids, make them perform on command, or catch them cheating. Authentic work minimizes such temptations.



## There's Wi-Fi everywhere (except here?)

Why should a parent or educational consultant like me visiting a school have more Internet access at McDonald's than at your school. Do everyone a favor and provide open Wi-Fi for visitors.

## Conclusion

Taken collectively, these handy-dandy tips might be described as “minimally invasive IT.” We should all seek to empower and do no harm. As an educator, I am obsessed with the question of “What is the smallest seed I can plant that generates the most beautiful blossom and the largest garden?” The more agency we grant our colleagues, staff, parents, AND students the greater return on investment we will enjoy, the greater the impact will be on learning, and our schools will be more harmonious.

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### About the Author

Dr. Gary Stager is a recognized pioneer in 1:1 computing, online learning, and computer science for all students. He has taught learners from preschool through the doctoral level and spent 42 years helping teachers around the world embrace technology as a way of amplifying the potential of each student.

Gary is a popular keynote speaker known across the globe for his fearless advocacy on behalf of teachers and children. Educators leave his presentations energized and empowered to change their practice and the world of the kids they serve. He led professional development in the world's first 1:1 "laptop schools," was a pioneer in online education and co-author of the "bible of the maker movement in schools."

Gary is the founder of the [Constructing Modern Knowledge](http://Constructing Modern Knowledge) summer institute for educators.

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