The Importance Of Hands-On, In-Person Education

(Going Against the Online Grain)

by

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Introduction

To learn anything, before the days of the Internet, one had to go to school, the library, buy books, or buy/rent video tapes. However, in-person training was the only option for learning a trade. This meant attending a class or series of classes where the human senses played a major role in gaining understanding. Chefs learned to use their noses to determine freshness; mechanics learned to use their eyes and sense of touch when making repairs; carpenters and cabinet makers learned to use their eyes, noses, and sense of touch when working with wood. Now that the Internet is so pervasive in our lives, it has become the go-to place for any kind of information, instruction, and entertainment. While it is convenient and is a good place to start, in my opinion, it is causing us to lose the skills and attention to detail that allow you to be called a Master Craftsman or Master Tradesman.

The Internet has indeed had a significant impact on education in general. You can now earn certificates, diplomas, degrees, and certifications via the Internet in just about any field. Having been raised in the era of going to brick-and-mortar institutions this author views the Internet a little differently: as a research tool, not as a learning tool. In college I earned the Bachelor of Science degree in Electrical Engineering. In my early days as an electrical engineer I had a very large collection of printed Data Guides. These guides, books really, contained specifications about the electronic components I used in my circuit designs. Granted, the Internet has made it easier to look up those same specifications. One positive side effect of the Internet has been that of helping the environment by eliminating the need for all of the paper those specifications were

printed on. It has also helped save my back from having to lift and carry around multiple boxes full of those Data Guides.

The question in my mind is which form of education is better, hands-on or Internet learning? This thesis will examine this question. The goal is to determine whether there is truly any benefit to one form of learning or the other. To achieve this goal this paper is organized into five sections. In the first section, Mentoring - Passing Skills from Generation to Generation, I will present my thoughts, observations, and personal experience with having a mentor and the importance of hands-on training. In the second section, Hands-On Learning Studies, I will present information from studies conducted on the subject and relate some personal experiences. In the third section, Apprenticeship Programs, I will present examples of modern-day efforts to close the skills gap in the building trades through apprenticeship programs. In the fourth section, Study Results vs. Personal Experience, I will compare my personal experiences with both hands-on and Internet training to the results of several studies and the results of the apprenticeship programs. The last section of this thesis, Conclusion, I will provide some final thoughts.

Mentoring - Passing Skills from Generation to Generation

Before we proceed, let us define three terms: master, apprentice, and mentor. According to *Merriam-Webster* (www.merriamwebster.com):

- **master** - “a worker or artisan qualified to teach apprentices;" or “an artist, performer, or great player of consummate skill.”

- **apprentice** - "someone bound by indenture to serve another for a prescribed length of time with a view to learning an art or trade;" or "one who is learning by practical experience under skilled workers a trade, art, or calling."
- "**MENTOR** - a friend of Odysseus entrusted with the education of Odysseus' son Telemachus."
- **mentor** - "a trusted guide or councilor."

As a way to give back to the photographic industry I teach seminars and day-long hands-on photographic workshops. Some of the excuses I hear often from those opting to learn via the Internet instead of in person are convenience, cheaper cost, self-paced learning. However, the feedback I have received after teaching a seminar or workshop indicates the hands-on aspect of the class was worth the time and money spent. This reaction comes from photographers who would normally seek out the Internet first for such instruction. Personally, I learn best by doing - touching, seeing, and trying something out for myself. You continually make mistakes until you begin to see it - get it - understand it. The best way to learn anything is by doing it under the guidance of a mentor. By practicing, you show your mentor that you can and have improved.

In my observations, the tradition of passing skills from generation to generation, particularly the skills of using our hands to create beautifully crafted items, is disappearing. There was a time when someone called a Master Craftsman, e.g. Master Electrician, Master Carpenter, Master Cabinet Maker, etc., would take an apprentice under their wing and teach them the skills of a craft or trade. Over time, under the guidance and oversight of their mentor, and through frequent practice, the skills of the apprentice improves significantly. During this time they also learn the "secrets" that

would slowly turn them into a higher skilled, detail-oriented novice. They would acquire the ability to create a vision of the final product in their minds which would cause their hands to sculpt the medium until their vision becomes reality - a work of art for the particular trade. Once the apprentice's skills were honed to the point where their skills become innate, advanced enough to handle challenging and complex creations with ease and finesse, they too would be finally called a "Master Craftsman."

In my early days as a professional photographer I was fortunate to have such a photographic mentor. His name was Bart Straub (*aka* Bart Stevens), M.Photog., MEI., Cr., CPP. Bart was a Monte Zucker, M.Photog.,Cr.,F-ASP disciple. Monte was a master at romantic portraiture and one of the reasons I became a professional photographer. While under Bart's tutelage, I learned how to be a good wedding photographer. Bart taught me how to relate to people in general and my clients specifically. I also tried to learn how to be a better business owner.

Unfortunately I lost my photographic mentor to cancer back in 2005, the same year I lost my father to dementia. My father was a different type of mentor. He was a master handyman, from whom I learned carpentry, electrical, plumbing, roofing, painting, and auto mechanics. He did not guide me closely; he showed me what to do and it was up to me to get better on my own. For many years my brothers and I were his helpers - loading and unloading the station wagon, cleaning up the job site, and getting him coffee and cigarettes. As we got older, we would help him with the demolition process, followed by the cleanup process before the rebuilding began. The demolition work was fun but we had to take things apart in a certain way. When we were older still, we would help him with the building part of the job. First he would do something, then

we did it. I can still hear him yelling at us when we did not do it “the right way." We did not realize it at the time but that was his way of teaching us - we just saw it as being yelled at. However, we did learn some great skills, not from a book, but by in-person learning via hands-on!

Teaching can also be a two-way street. First you show the students your way or, as some would say, “the right way." Then, if you are lucky, you have a student that shows you the same thing but from a different perspective. If you have listened and are truly on top of your game, you can point out the disadvantages of the alternate methodology that are or may be obvious. However, the fact that you were truly listening may cause you to reexamine your methodology, dig deep into your way, comparing it to this new way. After a period of time you may find that (1) your way is truly the best way, (2) the other way is the best way, (3) either way yields the same or similar results, or (4) a combination of the two methodologies yields superior results.

Currently, my teaching partner, Anne Kelley Looney, Cr.Photog., CPP, and I teach an interactive lighting class called “Emulating the Masters." In this class we show how the Master Painters from the 1400’s through the 1600’s “paint” the natural light or candlelight in their portraits: painters such as Rogier van der Weyden (1400-1464), Titian (1400-1464), Leonardo da Vinci (1452-1519), Michelangelo (1475-1564), Raphael (1483-1520), El Greco (1541-1614), George de La Tour (1593-1652), Rembrandt (1606-1669), and Johannes Vermeer (1632-1675) to name a few. We discuss who may have inspired or influenced them, their use of light quantity, quality, and direction. We use photographs we took at the National Gallery of Art (www.nga.gov) in addition to photographs in the numerous books available of the Masters’ works. Our photographs

show how the works are framed and lit in the museum setting while the photographs in the books focus on the works themselves and add commentary. Composition is discussed, as well as each student's feelings as they examine the photographs. Anne worked at the National Gallery of Art for many years and has traveled around the world on their behalf. My education is in electrical engineering - not art. So Anne and I spent a lot of time at the National Gallery of Art and the National Portrait Gallery (npg.si.edu), sometimes as visitors, and occasionally with museum curators. These sessions helped to educate me about the art world in general and also about different painting styles and techniques. The Internet may have provided me with history about each painter. However, the Internet would not allow me to see the art pieces in person, up close, properly displayed with the proper lighting. Further, the Internet would not allow me to ask the experts questions about the pieces and engage in discussions to clarify my understanding the development of the art pieces as well as that of their creators.

From the "Emulating the Masters" class, a second class was developed called "Hollywood Studio Lighting." It is also a hands-on class using the same concept as "Emulating the Masters", but focusing on the photographic works by Hollywood Glamour photographers George Hurrell, Clarence Sinclair Bull, Ernest Bachrach, Frank Powolny, Scotty Melbourne, Paul Hesse, and Whitey Schafer to name a few.

As previously mentioned, in our classes we discuss the art pieces, then have each student go through a series of art exercises to help open their minds and let their creativity out. Towards the end of the discussion period we introduce photographs of prominent photographers. As we did with the paintings, we discuss the photograph's composition, lighting, and feeling. Finally, we have each student select a painting or

photograph to emulate. They try to recreate the pose but, more importantly, the lighting using either artificial light (continuous and/or strobes) or natural light. By trial and error some succeed while others don't, yet everyone gains a greater respect of what the original maker may have gone through to create their piece. Those students who do not succeed are encouraged to practice on their own. We call it a homework assignment because we ask them to send us examples of the results and offer to discuss it with them later.

Hands-On Learning Studies

In 2012, Elizabeth Marincola, then President of the Society for Science & the Public and also publisher of *Science News*, wrote a blog for the *Huffingtonpost* (huffingtonpost.com) entitled "Hands-on Learning Boosts Success in the Classroom and Beyond." Her blog states,

> *In order for our children to succeed in these challenging times — and for society to benefit from their potential — it is vital that students learn how to connect what occurs in the classroom with their lives and the world outside of the classroom.*
>
> *One way to do this is by encouraging independent hands-on research. Creating and conducting their own experiments allows students to explore topics that interest them. Interested students are, in turn, more motivated and successful. A 2009 study (*news.uns.purdue.edu/x/2009a/090128DarkStudy.html*) conducted by researchers at Purdue University found that 8th graders who were taught about human impacts on water quality through a hands-on learning method, as opposed to only the*

textbook and lecture method, showed higher comprehension of the concepts, particularly among those students where English was not their first language.

The first paragraph of the Jan. 2009 Purdue study referenced above (K. Medaris, et al.) is entitled ”Hands-on Projects May be Best Way to Teach Engineering and Technology Concepts.” In part, it states, “the study has found that the best way to get students interested in engineering and technology at an early age may be to focus less on textbooks and more on interactive, problem-solving design projects.” The study concluded with the following: “Further study is needed, but this is an exciting first step in proving the value of engineering/technology design modules in the classroom," Dark said. "As a nation, we want to increase engineering and technology education in K-12 and also improve students' critical thinking skills, which we showed can be done though creative, hands-on design projects.”

As an electrical engineering graduate myself, I can testify that the engineering lab work that was part of my curriculum was invaluable. In fact, because I was working in the industry while going to night school, I was glad I already had some practical experience because it made the lab work easier for me and afforded me the opportunity to help my fellow classmates, some of whom had no hands-on experience prior to the lab class. Photography is an art and science which utilizes a lot more technology today than it did ten years ago, which makes hands-on training more important.

In the film days of photography, technology was confined to lens speed, remote flash triggers, and flash output power. Today, the cameras are computers, on-camera flash systems are computers, light meters are computers, remote flash triggers and

receivers are computers. Then we have the actual computers - laptops, desktops, tablets, and phones. Let's not forget the computer operating systems and software tools - Adobe Photoshop, Adobe Lightroom, Adobe Camera Raw, etc. All need periodic software or firmware upgrades. Even though the update/upgrade instructions have improved and are automated, for the most part, those less technically savvy still need some personal guidance. Photographers are willing to help fellow photographers understand their equipment and/or software applications.

Another example from my personal story: I attended Aviation High School (www.aviationhs.net) in New York. Each day was divided into two parts - academics and shop. The academic part was four hours of college prep classes (high level math and science with history and English thrown in for good measure). The shop part was four hours of common avionic classes. We spent eight hours plus a lunch hour in school everyday. Towards the latter half of the junior year and all of the senior year, shop class was geared towards either the power plant license or airframe license. The federal license exams were taken at the end of the senior year. A select few could also return for a 13th year and go for the other license.

There were other vocational high schools for different trades that balanced college level academics with hands-on training. In today's world, course work could be taught online, but the trade skills must be taught in person. You do not learn how to repair a jet engine, piston engine, electrical system, hydraulic system, or build the different air frame components without physically touching them. With online training you would also miss the excitement of having hot motor oil or hydraulic fluid running

down your arm, not to mention being graded on how well you kept your white coveralls clean!

The Brookings Institution (www.brookings.edu) is a nonprofit public policy organization based in Washington, DC. Its mission is to conduct in-depth research that leads to new ideas for solving problems facing society at the local, national, and global levels. It has an article entitled “Accelerating progress in education with hands-on, minds-on learning” written by Rebecca Winthrop, et al. This article is part of its *Skills for a Changing World* project which explores opportunities for innovation in education to develop a breadth of skills. The article says, “Providing children with the breadth of skills they need to become healthy and active members of society requires the kind of learning that cultivates empathy, fosters resilience, encourages creativity, and promotes cognitive processing. Research shows that learning happens best when it is done in a way that is practical, relevant, and engaging—rather than theoretical and decontextualized—and that learning happens everywhere, anytime.” You can say PPA’s Certified Professional Photographer credential does the same thing for professional photographers, especially if the candidates take classes that include applying the concepts learned with hands-on experience.

An article by Julia Anderson appearing in the April 2015 *Omaha World-Herald* (www.omaha.com) encapsulates some of the important questions of theoretical vs. hands-on education. The article is entitled “Flipping learning around: Students watch lectures at home, do hands-on work in class.” The article highlights David Contreras, an Anatomy & Physiology teacher at Ralston High School (www.ralstonschools.org) in Ralston, NE. He teaches a “flipped class.” Anderson explains it this way:

Although it can take different forms, flipping generally involves switching when and how teachers deliver lessons and when students complete hands-on assignments. The basic format involves assigning students to watch a short video recording of a lecture — outside of school time, in lieu of traditional homework — and then doing an assignment the next day in class.

Later, Anderson continues: *The idea behind flipping is that students get their first taste of new material outside of the classroom, and then they do the harder work of applying, analyzing and synthesizing that information in class, where the teacher and peers can help, instead of struggling alone at home. It's essentially what literature teachers have done for decades.*

David Contreras says *"… the biggest advantage of the practice is that it buys him time in the classroom — time for more of the hands-on activities that drive science classes, and time to work with students, particularly those who are struggling."*

Anderson continues: *Cynthia Brame, assistant director of the Center for Teaching at Vanderbilt University (vanderbilt.edu), said the instruction method connects with much of what researchers know about how we learn.*

Used thoughtfully, she said, the flipping model prompts teachers to think first about their goals when designing lessons — what they want students to know and how they know when students get it.

It also emphasizes cooperative learning, in which students are truly working together, she said. A wealth of literature indicates that cooperation can help kids learn better, particularly higher- and lower-performing students.

"It's got sort of a cute name," said Brame, who has written a review of flipping at the college level. "But the principles that underlie it are really sound and fit with decades of research. That's not to say it's the only way, or that there's never any space for lectures. But there's a lot of evidence that this is a sound model for many types of lessons.

Studies of flipping so far are limited, although some teachers say they see increased engagement.

Brame's review cited several studies based on large college classes that found significant learning gains, including one at Harvard University (harvard.edu) that compared students' performance in introductory physics taught with a flipped model to that of students in traditional classes.

However, researchers at Brigham Young University (byu.edu) and a Brazilian university compared flipped and unflipped classrooms. Both kinds of classrooms used a more active style of instruction rather than the standard front-of-the-room lecture, and no difference in gains was found.

The researchers concluded that the active instruction style, not the flip itself, may be what mattered when it came to learning.

Although the above article does not directly fit into the theme of this thesis, it is important. It is interesting that teachers across the country are finding ways to blend

Internet learning with hands-on learning. While the article indicates the jury is still out in terms of effectiveness, the concept is spreading across the country. As more teachers adopt the concept and adopt it well, there are signs indicating there are mutual benefits.

Apprenticeship Programs

Working with my hands is natural for me. Having learned carpentry, plumbing, electrical, and mechanics (auto and aircraft), I enjoy doing the work myself but also enjoy learning new techniques. I have been an avid watcher of "This Old House" (www.thisoldhouse.com) since it began back in 1979 and its spin-off shows "The New Yankee Workshop" (www.thisoldhouse.com/new-yankee-workshop) when it began in 1989 and "Ask This Old House" (www.thisoldhouse.com/watch/ask-old-house-tv) when it began in 2002. Over the years I have learned by watching the shows but also by using the techniques they demonstrated - some successfully, others not. Periodically "This Old House" would use interns as helpers on their show. In recent years they began using and showcasing apprentices as well as highlighting schools and other programs that train people to work in the building trades. In 2017 they partnered with Mike Rowe (mikerowe.com/about-mike/bio/) of Dirty Jobs fame and his mikeroweWORKS Foundation. From the mikeroweWORKS Foundation "About Us" web page (profoundlydisconnected.com/foundation/),

> *The mikeroweWORKS Foundation is a 501(c)(3) public charity that rewards people with a passion to get trained for skilled jobs that actually exist. As CEO of the foundation, Mike Rowe spends a significant amount of time speaking about the country's dysfunctional relationship with work,*

highlighting the widening skills gap, and challenging the persistent belief that a four-year degree is automatically the best path for the most people.

Through its scholarship programs, including the Work Ethic Scholarship Program, the foundation provides financial assistance to qualified individuals with a desire to learn a skill that is in demand. The foundation has been instrumental in granting more than $3 million in education for trade schools across the country.

The main reason “This Old House” and the mikeroweWORKS Foundation have teamed up is to bring awareness and support for closing the building trades skills gap. They are shining a spotlight on the fact that the building trades are suffering from a shortage of skilled workers. “This Old House” brings some of these students on its show to apply what they have learned on an actual building/renovation/restoration project - hands-on education. These students get to work side by side - in-person - with and get hands-on training from very skilled craftsmen; carpenters, electricians, plumbers, masons, and landscapers. They see first hand the issues that arise and learn how to solve them on the spot. Can you learn carpentry from the Internet? The concepts perhaps. But you cannot feel or smell the wood. You cannot see whether the board is straight, twisted, bowed, or cupped.

The “The This Old House” 2018 project house was actually 2 historic homes in Charleston, South Carolina; the 1840’s Single House and the Elliotborough project, a 2,000 sq. ft. 1890’s Victorian-era home. Students from the American College of the Building Arts (americancollegeofthebuildingarts.com) designed, fabricated, and

installed a custom iron gate. Their Blacksmithing skills were showcased as they taught Tom Silva, the show's general contracting expert what it takes to build the iron gate.

Study Results vs. Personal Experience

As mentioned, the Jan. 2009 Purdue study states, in part, "the study has found that the best way to get students interested in engineering and technology at an early age may be to focus less on textbooks and more on interactive, problem-solving design projects."

From my personal experience, the teacher in one of my high school piston aircraft engine shop classes would first review the concept, using a text book, of how a magneto works to produce an electrical charge that ultimately generates a spark via a spark plug. Some in the class could not grasp the concept explained in the text book. When it came time for them to put the magneto back together, mount it on the test stand, and go through the process of adjusting it, they were not successful. The test stand had a motor that spun the magneto as if it were mounted on a piston aircraft engine and 12 spark plugs. You had to adjust the inner workings (points) of the magneto and rotate the magneto housing to adjust the timing to produce a spark. No spark - you failed the test. With the magneto in pieces on the bench some, including me, were able to study the spark-generation process (magnetic induction), assemble the magneto properly, generate a spark, and pass the test. Then the text book explanation made sense.

This example from my personal experience also helps to prove the Brookings Institute article discussed earlier, "Accelerating progress in education with hands-on, minds-on learning" and the statement "learning happens best when it is done in a way

that is practical, relevant, and engaging—rather than theoretical and decontextualized." To pass the magneto test in high school we had to be engaged, hands-on, have the cognitive ability to understand physics, and use it properly in a mechanical device. From this I went on to earn an electrical engineering degree and have a productive 40-plus-year career.

Conclusion

As studies have shown, learning and retention are improved through hands-on education, which includes guidance, oversight, encouragement, and practice. From my own personal experience as a student and as a teacher, I have found this to be true as well. Attending in-person photographic workshops and seminars provide direct and immediate feedback which, in turn, improves upon efficiency by saving time. Long hours are not spent reading and re-reading a web page or repeatedly watching a web video. Instead, an instructor is looking over your shoulder, guiding you. When sensing the concept is not being understood, they can rephrase their explanation or change their demonstration technique, until you grasp the concept. The Internet does not sense your struggles and adapt its presentation to better explain the lesson.

Referring to the article on flipping, one has to wonder how successful the following would be: have a group of photographers watch an Internet video on portrait lighting the night before a day-long workshop. Then, at the start of the workshop, have those same photographers use what they have learned by watching the Internet video in the workshop's studio setup. Would they use their own knowledge or the techniques shown in the video? Would they even watch the video? Food for thought as I may give this a try.

A good instructor, like a mentor, gives you encouragement when you are struggling and challenges you when you are slacking off. They help you to refocus, especially when they know you can do better. Then, at that special moment when you finally do conquer whatever it was that has given you so much trouble, you are filled with an immense sense of achievement. Your mentor stuck with you until that magical moment arrives - your moment of accomplishment, their moment of pride seeing you achieve it - both glowing with excitement. You can’t get that from the Internet.

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