

HISTORY CAN SHAPE OUR FUTURE

ABSTRACT This paper builds on topics presented by several established designers and emphasizes the importance of starting with primary and secondary education before the landscape of design can be changed in the future. One of the biggest challenges in our education system today revolves around the time to restructure the curriculum and provide additional funding for faculty to develop this curriculum. But, with emerging careers and increasing demand of designers within various fields of work, we need to optimize pilot education programs to better prepare students for opportunities and increase diversity through exposure with new technology today. Similar challenges in constructing new methods to our education align with the formation of the Bauhaus art school, that opened in the early 1900s. Modernizing styles of teaching, inclusivity between cultures and accessibility to design software, all provide additional ways to learn and collaborate.

Keywords: **design education, technology, design accessibility, diversity in design, inclusivity in design**

1. INTRODUCTION

“Overall the schools’ results are often a muddled mess, the end result of programs pulling in every direction...” – Gadi Amit.

We are seeing more gaps in our education system than we ever have before due to the demand of many skills required from designers and the increasing use of technology among different design fields. In reference to the quote mentioned above, Gadi Amit, the head of a major Silicon Valley Industrial Design studio, talks about how the education system is failing our design students today. As new career paths start to emerge, the job criteria for traditional designers and the technically-oriented designers will become blurred, from previously needing an ample amount of fine art skills, to now needing fine arts integrated with technology. The clashing with the tradition-based designer against the technically-oriented designer has been recognized as far back as 1952 by Gottfried Semper (Budd, 2011).

As we begin to discuss where we are today in education, it is important to keep in mind a major shift that happened in the early 1900s with the establishment of the Bauhaus. The forming of this German art school was intended to unite opposing art studies and manufacturing, which created a similar type of disruption we need in our education system today. History is now repeating itself with new socioeconomic challenges that have always been a source of contention when establishing new design methods. With today’s challenges to keep up with student-ready expectations, there is a constant need to change how we learn and prepare our students for the demand of their career. As we

look at how our curriculum is structured today, the tension between fine arts and applied craftsmanship has been ongoing, but with the right evaluation of our current teaching methods, support and access to software, students will receive all the fundamentals in design to prepare them for any challenge ahead. As new design fields emerge, there is a need to re-evaluate how we teach and whom we teach. The future of design education will need to be inclusive, immersive, collaborative, in concurrent with being widely accessible to the youth, as design expands in the world of technology. Students and teachers will need to adapt to the fast-paced and ever-changing environment in every design field.

Today's design curriculum will still follow design instruction and principles that were established back in the development of the Bauhaus, but Jim Budd (Chair and Professor of Industrial Design at Georgia Tech) stated in his conference presentation, "Can Industrial Design Education Turn the Corner?", that institutions are having problems trying to "cram more content in an already overloaded curriculum". It is difficult for one designer to learn all the technical, fine arts, soft skills as well as software needed within a typical four-year college degree, so how can we prepare students to easily adapt to upcoming technical roles?

2. DESIGN EDUCATION

2.1 SKILL SET DIVERSITY

Before taking a deep dive into the future of education, it is important to look at our current system because redefining the future will need to start with redefining primary and secondary education and the students who have access to design. Most schools require students to take a semester of fine arts class for graduation, but not every educator or counselor has the appropriate knowledge to expose students to opportunities in design. At this stage, we can begin to tackle the lack of diversity in race, gender and skill sets, so that we can then shape our design future. John Maeda's article on "Higher Education vs. Longer Education" clearly defines how culture is now the product of its students which is especially true when comparing schools (Maeda, 2014). In higher education, students are paying for the opportunity to sit among many talented and diverse students to learn and network from, to prepare them in areas where classes cannot. However, the design field is no longer calling for those who are just a master in fine arts. We need scientists, engineers, sociologists etc., who all have an interest in problem solving through design. How can we attract more students with different skill sets and cultures into the field of design to build a bigger network of modern designers?

Attracting more students will mean we will need collaboration between teachers and professionals to expose them to opportunities in design. In 2013, former President Obama noted the need to redesign America's high schools to better prepare students for the high-tech economy of the future. His remarks became important principles of the U.S. Department of Education (ED) as the Next Generation High Schools. The principles include:

- Redesigning academic content and instructional practices to promote active and hands-on learning, aligned with postsecondary and career-readiness.

- Personalizing and tailoring academic content and learning to strengthen the connection to the educational needs and interests of individual students.
- Ensuring strong content knowledge and skills for teachers in all subjects, including STEM.
- Providing high-quality career and college exploration and counseling on options for students after high school graduation.
- Redesigning the scope and sequence of learning time in more innovative and meaningful ways, incorporating innovations such as educational technologies, project-based learning, and competency-based progressions.

From the U.S Department of Education

Through this redesign, we can hope that students will have the support needed with small learning communities and a personalized career path. Professional organizations are doing a lot of positive work with companies such as Autodesk to connect schools with educational free licenses, so students can begin to have exposure to expensive software. In the article “Designing a Place Called School”, the ED has already begun to pilot a program to explore different ways to engage students through interactive learning (Salen, 2017). This model shows how collaboration with industry professionals, educators and students can work together and design a new style of learning that could be inclusive and diverse. The ED’s study also showed how game design can be integrated into a school’s model, in which will bring awareness to design’s capabilities to students that have never been exposed to the profession. Many factors were considered when piloting this program such as the size and type of institution that made this program possible, but we can still use the learnings from this study to apply at a smaller scale with after-school programs or career days. As we begin to collaborate more with schools, we will see the engagement increase in students that participate in these interactive workshops. So why can’t we go ahead and implement programs that have proven to be successful? It is not easy. Faculty time and money all need to be factored in when speaking about redesigning academics and there is not a “one glove that fits all” solution, but professionals can take steps to partner with schools to begin the conversation with teachers.

2.2 ACCESSIBILITY

Students spend a big majority of their downtime on their phone, computer, and with entertainment, so instead of trying to find more time to incorporate learning, we can replace some of that time by using mobile apps to foster engagement. Design education has evolved with many tools created to help students learn on their own as well as with the support of their peers and teachers. Today, students are currently able to participate in webinars from all over the world, dive into 3D programs that are becoming cloud-based, visualize products completely virtually to understand scale, and achieve better accuracy down the road of development. Not only has our technology evolved but so have our processes. Designers are constantly finding ways to become more efficient in their role as team members despite the pressure of deadlines and project deliverables. As time becomes more valuable, tools of learning in our education system have begun to evolve using an increasing number of apps that are widely accessible to children with smart devices. The fact that accessibility in design can be a challenge as it pertains to

certain communities, school districts, low-income class neighborhoods and even professional outreaches, technology plays a big role in how students can learn new skill sets without completely enrolling themselves in additional classes that could be costly. Some great examples of recent applications that will define our education in the future and help reach racially and culturally diverse populations that lack design exposure are given below:

- Nearpod (Figure 1) has changed classroom learning to become more interactive using student's mobile devices. As more students grow up with smart phones and smart tablets, they have created a way to turn it into an opportunity to stay engaged during the day. As the field of design becomes more complex, students will need to have access to more information. This will not be all learned through primary education, but will need to be encouraged and promoted.



Figure 1. Students are using the Nearpod software for lessons

With programs, such as Nearpod, teachers won't have to rely solely on any design expertise to expose students to the field, or take the time to restructure the curriculum with long staff meetings and seminars outside of normal working hours. This app allows teachers to upload lessons and customize projects remotely and allows for students to ask for help from their teacher at any time.

- As students enter secondary education, there have been other applications such as Padlet which lets them create using a blank canvas, sharing their ideas through a cloud based app. Where collaboration is an integral part of the design process, students can now connect their ideas with their classmates and even work on projects with professionals without always being in the same room. Cloud based technology has really become a useful tool with many programs today like Autodesk Fusion 360, Adobe and Sketchup that speed up design processes allowing different team members to tackle or critique designs independently. Many companies are focused on speed-to-market and working on projects by sharing ideas/concepts over a protected site will help companies become more efficient and eliminate duplicate work. This feature can also be used in a school setting for students to collaborate with teachers and other classmates from around the world.

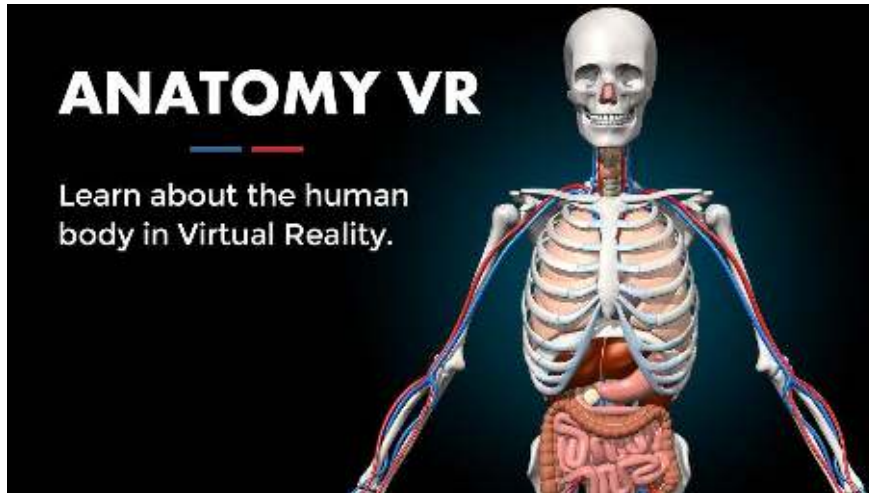


Figure 2. One of Unimersiv's educational experiences which allows you to explore the human body

The app Unimersiv (Figure 2) believes that virtual reality should not only be used for gaming, but also for education. They built this app using inspiration from Edgard Dale that states, “students remember 20% of what they hear, 30% of what they see and up to 90% of what they do or simulate”. Many companies are starting to incorporate virtual reality (VR) into forms of marketing to connect and create empathy with the consumer. This can serve as a similar function with the classroom to get a deeper understanding of their assignments and how their choices as a designer could impact the consumer.

As we consider these applications, imagine how much students can learn about different manufacturing process, take virtual tours of different cities to learn about the environment they are designing for, or even connect with other students globally to share ideas. (Figure 3)

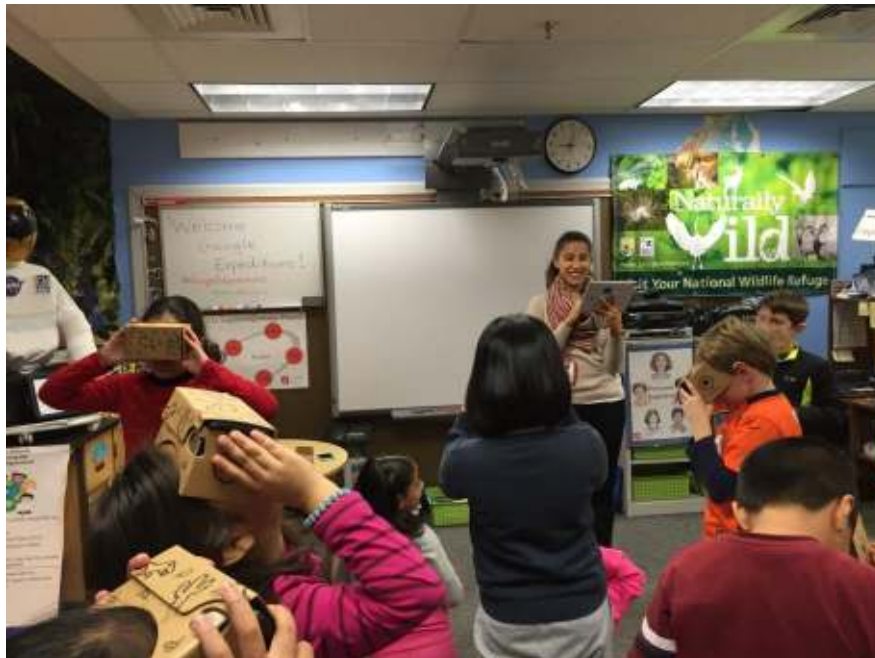


Figure 3. “Google Cardboard Expeditions” by [Laurie Sullivan](#) licensed under [CC BY 2.0](#)

2.3 CULTIVATING THE ENVIRONMENT (INCLUSIVITY)

Finally, we will see more community innovation spaces within schools and neighborhoods. A good example of an innovation space funded by the community is The Maker Spot (Figure 4). This is driven by people who want to make a change and create a space for residents to learn and create by using technology provided through a grant. Professionals have learned how much environment is important when creating a culture of inspiration in the workplace and it shouldn't be left up to teachers and institutions to build this type of community space in every school, that could overall increase the costs of education. Instead, this model uses a support system that is cultivated with initiative and self-perseverance.



Figure 4. The Makerspot space

A newly focused part of the design process which is incorporated in Design Thinking is exploring the “fuzzy front end”. The fuzzy front end is described by Elizabeth Sanders (Sanders, 2017) as “a space for visual and virtual exploration where participatory prototyping is used, so that different people can be a part of the up-front design process”. This part of the process is so important as we explore every scenario and stretch the possibility of a concept and this takes a special environment. WeWork, which is founded by Miguel McKelvey and Adam Neumann, is built on the idea of a collaborative environment and had major growth since opening in 2010. The locations are built to be self-sustained and technology has allowed for this space to manually led. The pressure to create better, faster, higher-quality products will rely on pushing boundaries with new spaces that will encourage inclusivity. This means the user, the designer and the educator can all be involved in the up-front work of the design process and that is not something you can teach, but rather cultivate.

3. POST- SECONDARY EDUCATION

There are other factors that should be considered after these students prepare themselves for higher education, and that is choosing the right institution. The Institute of Education Services (Alfeld, 2019) have recently put out a proposal to challenge small businesses to find ways to help students make informed decisions about college programs and financial benefits. As we talk about the numerous educational tools that provide access to students, this is another great initiative that will be helpful in decreasing drop-out rates and building confidence in their career path.

One thing that will be crucial to emerging career paths after we have established a more inclusive, diverse and accessible group of designers is to place students on a track that is worth their financial investment. Building “tracks” in a curriculum can provide a focused learning on an area of design as seen implemented with some schools in the U.S as well as internationally. Design now covers a wide range of disciplines and if the jobs are becoming more broad, majors will have to become either specialized or customizable. One way to tackle this challenge is to increase funding to hire more faculty, create new spaces, and license more software within school institutions. But with the financial burden private and public universities struggle with, these are difficult tasks to implement. We should also take advantage of increasing the time it takes to complete a degree depending on the student’s specialty. Maeda’s article on “Why Higher Ed is Slow to Become Longer Ed” tackles this issue from the stance on why extending the timeframe can become a solution to the many issues art institutions/universities are going through today. Although this might increase the time and funding required for faculty members to accomplish this new education model, it can save time in trying to restructure a model that has worked for so long. After establishing tracks that are customized for the student, externships in addition to internships provide a great amount of exposure at a company that can fill skill gaps and are usually seen as important experience required when looking for a full-time position. The integration of externships will immerse students into the workplace as part of the studio experience with shorter time frames, so they can continue to connect project assignments with real-world experience. This will certainly require a strong relationship between schools and professionals to maintain this offering. Finding ways to reduce cost in education while still maintaining a worth-while education will take additional faculty time and program testing to make a difference, however expanding on some of the education models we currently use could help ease the stress of students, especially ones that come from low-income families.

Pre-college programs established at schools such as Syracuse University, Georgia Tech, Pratt Institute etc. have been made possible with faculty involvement and can provide the support some college students need to succeed in their design career. Maybe pre-college programs become a requirement instead of being voluntary to better prepare students for the skills needed for full-time positions in the upcoming years. The future of education should expand on these new ventures at the very least, but certainly invest in the programs that are currently working. Regardless, we will need to look at not only re-working higher education but also paying attention to education from an early stage and implement programs where we can. Corporate initiatives and a passion to see change from professionals play a major role in bridging the skill gaps that are required in higher education.

4. WHAT'S NEXT?

As mentioned before, the Bauhaus was a big movement in redefining design education and cultivating an atmosphere that allowed for a new curriculum to unfold. However, when piloting a new program, funding became a huge problem which resulted in the closing of the institution back in the early 1900s. We have learned that increasing funding will alleviate some of the problems as it relates to fully supporting our students, but as we continue to work through these challenges, we should look forward to the exciting new fields emerging in design that create more opportunities for our students to excel in the future. As for today, the emerging design fields should attract students who do can more than express themselves creatively. We can confidently say that the design field attracts students that can exercise the right and left side of the brain, which includes the analytical and the emotional, and both can exercise different amounts of creativity. What tools can we create so students can make an educated decision about their desired career path, to decrease drop-out rates? How can we use apps and community spaces for students to learn and grow outside of the classroom? These questions should take in account the economy, regional differences, faculty funding, diversity and inclusion statistics, and many other factors to give students a plan of action and better prepare them for job placement. I want to propose that we continue to support and collaborate with start-up companies that are investing in apps for students, encourage our communities to create inclusive innovation spaces, and consider extending our education to create more focused career paths.

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