Sep 15th, 9:00 AM

Introducing high school students to design and creative thinking in a teaching lab environment

Gretchen Caldwell Rinnert
Kent State University

Jillian Coorey
Kent State University

Citation

DRS // CUMULUS 2013
2nd International Conference for Design Education Researchers
Oslo, 14–17 May 2013

// DRS
CUMULUS
Oslo 2013

Introducing high school students to design and creative thinking in a teaching lab environment

Gretchen Caldwell RINNERT[*] and Jillian COOREY

Kent State University

Abstract: Many students in the United States have limited exposure to design thinking, formal techniques or creative experimentation. For many, a design education begins in college, as one selects their major. Unfortunately, many high school art programs have been eliminated or dramatically reduced, resulting in students receiving less creative exposure and limiting their design preparation before college. Creative problem solving skills are in demand. Sir Ken Robinson, a recognized leader in the development of creativity and innovation, believes our schools are educating students out of their creativity. He argues that we train students to become good workers instead of creative problem solvers. The status quo stifles our profession, with students ill-prepared to face the daily challenges as they begin their academic journey and professional career.We developed Inspire, a creative camp that educates teenagers about design, creativity and critical thinking. Our goal is to prepare students to enter higher education by building insightful portfolio projects, gaining knowledge about the profession while working with mentors. The camp serves as a teaching laboratory for faculty and graduate students interested in design pedagogy. Graduate students participate in curriculum development, lead projects, write lectures and test teaching techniques in a low-stakes arena.

Keywords: design education, k-12 curriculum, creativity

* Corresponding author: School of Visual Communication Design | Kent State University | USA | grinnert@kent.edu

Introduction

In today's society, there is an increasing exposure to design artifacts, from magazines, posters, iPods to ebooks. However, one problem remains, most of society doesn't know what design means. Design has become a "catch-all," frequently repeated in the mainstream media and used in a variety of disciplines from architecture, to art and even business.

As design educators, we have found this unclear definition of design extends to students. Often, a high school student's knowledge of design revolves around experiences in art classes focused on formal thinking. As a result, they have limited exposure to process, prototyping, typography and basic design principles. The student definition tends to be based around artifacts and statements that describe what they will make. Their value is focused on the "making," not the thinking, understanding or the conceptual process. Additionally, as those high school students begin selecting colleges and majors, their parents and guardians do not grasp what it means to be a "designer." Their collective and limited knowledge of the field can hinder students from entering design.

As a result, many of our introductory courses are filled with students underprepared to declare a design major, let alone hit the ground running. Additionally, a number of students transfer into our program from other majors and universities. Their lack of knowledge about design led them to find our major after already completing a year or two of school. In response, we developed Inspire, a creative camp to educate high school students about design, photography and illustration.

Inspire is a week-long creative camp that helps teenagers learn about design, creativity, critical thinking, fast prototyping and experimentation. Our goal is to prepare students to enter higher education by building insightful portfolio projects, gaining knowledge about the profession while working with both academic and professional mentors. Inspire serves as a platform to cultivate creativity and demonstrates designs relationship to communication, information, commerce and the global economy. Inspire places a strong emphasis on process and a playful exploration of materials, strategy and media. As Inspire is a camp, it is the ideal setting to try skills, experiment with new materials and leave behind the structure, expectations and rigid constraints of the traditional classroom.

Creative Thinking: A 21st Century Skill

As design plays an ever-increasing role in our society, creative problem solving skills are in demand. Sir Ken Robinson, a recognized leader in the development of creativity and innovation, believes our schools are educating students out of their creativity. He argues that we no longer maximize a person's creative potential and abilities. Rather, we train students to become good workers instead of creative problem solvers. The status quo stifles our profession, with students ill-prepared to face the daily challenges required as they begin their academic journey and professional career in design.

A 2011 article by Fast Company, titled "Why Education Without Creativity Isn't Enough", emphasizes the need for creative thinking in our education system while comparing and contrasting work environments of countries around the world. "To compete long term, we (the United States) need more brainstorming, not memorization; more individuality, not standardization" (Fast Company 2011). In 2010,

IBM published Capitalizing on Complexity, a study that included the top agendas of global business and public sector leaders. The report concluded there are three widely shared perspectives, one of which stated, "the single most important leadership competency for organizations to deal with this growing complexity is creativity" (Robinson 2011, p. 7).

Creativity is critical to all fields. Students in all disciplines can benefit from educational experiences involving creative thinking, brainstorming, communication and teamwork. The design process lends not only to visually creative fields but also to health, sciences, product development and engineering. Our process includes research, audience and user investigation, ideation and brainstorming, prototyping, testing and refinement. We consider context of use and functionality along with formal thinking. Even a limited design education informs a person about problem solving techniques and influences them to consider the mass amount of messaging and visual communication they come in contact with daily. The design process and exploration is one that offers students from all disciplines a chance to find inventive answers while also becoming critical consumers of information and visual culture.

As design educators, we emphasize and reward creativity, process and innovation. We have incorporated more projects in our curriculum focused on expanding ones creativity and have extended this effort to Inspire. Our mission is to enrich students' lives through the disciplines of design. Each day is a new experience allowing students to explore, grow and expand their abilities. Our custom-designed curriculum covers the following disciplines: print design, three-dimensional design, motion and animation, photography and illustration. Students engage in projects that combine basic research tactics, brainstorming and creative thinking while they envision, innovate and experiment.

Increasing student retention and success

In addition to exposing students to creative thinking and design, our goal with Inspire is to increase a student's success rate as they enter college. Recent statistics of first- to second-year retention rates at four-year public universities in the United States are at a national average of 73.3% (ACT Institutional Data File 2011). Specifically, at our university the percentage of first-time students who returned to continue their studies in the Fall of 2011 was 75% (National Center for Education Statistics, 2012). Meaning nearly 1 out of 4 students didn't return for their second year of college.

The transition from high school to college brings many changes, challenges and hurdles for students. Inspire gives students the opportunity to engage with faculty, current graduate and undergraduate students, easing their transition as they become familiar with our program and university. Throughout the week there are daily higher education topics, which help prepare students for entering college. For instance, during Inspire 2012, students had the opportunity to meet and interact with the Dean of our college. They toured The Tannery and Glyphix, two student-run design firms within our college, where they learned what possibilities await them. They heard from undergraduate leaders of student organizations informing them on how to become an involved student. Attendees were introduced to the school facilities, toured campus, worked in college classrooms and ate in the dining halls, experiencing the life of a college student first hand.

A Primer in Visual Literacy

Visual literacy among teens is a vital skill that is often not addressed in high schools. According to Rick Williams and Julianne Newton, authors of Visual Communication: Integrating Media, Art & Science, visual intelligence is "the ability to observe, understand and respond to images, light, symbols, patterns, colors, contrast, composition, and balance." (Williams 2007, p. 7) If we are not educating students to be visually intelligent how can they develop literacy for engaging and creating ethical visual artifacts. Furthermore, Williams and Newton explain, "Literacy continues to be misunderstood and applied. True literacy includes the ability to both understand and create in the communication forms of one's culture and society."(413) Many of our students read and consume these messages without a serious consideration of their impact on their personal beliefs and the global community. Yet, many students are engaged in design activities by creating YouTube videos, posters for school projects, or a simple website for a friend's band.

Our culture is inundated with visual messages on a daily basis through news media and popular culture. Research shows that high school students are beginning to research visually, meaning they perform image and video searches online prior to text searches. (Helft, 1; Ito, Horst, Bittani, Boyd, Herr-Stephenson, Lange, Pascoe, Robinson, 22; personal survey) High school students are less cognitively developed than adults and lack life experiences that assist them in understanding visual language. While students visually consume media and visual artifacts this doesn't mean that they understand the levels of carefully constructed, manipulated and curated information they come in contact with on a weekly, daily and hourly basis. Inspire provides attendees with an understanding of what it means to be visually literate by encouraging creative exploration, critical understanding, image research and the development of a visual language to help prepare them for the digital and visual world. We discuss the basic design principles that cover composition, form, typography, message, color, lighting, motion and contrast. We focus on defining and discussing these key visual components giving Inspire attendees the basic vocabulary needed to be visually critical.

Inspire as a teaching laboratory

At Inspire, projects last one day compared to the several weeks of a typical undergraduate project. It is a low-stakes opportunity to test new theories, projects and curricula. Vital areas of exploration and study have included:

- New collaboration models and curriculum
- The arrangement of effective studio space for collaboration
- How students can best utilize peer-to-peer learning in a studio
- How technology can be used more broadly and enhance the creative process
- How creative communities begin, thrive and continue after an experience like Inspire
- How to strengthen design foundations and better prepare entering freshman

Inspire serves as a platform to develop future design educators. Graduate students work as camp instructors, involved in curriculum planning and development working with full-time faculty. Camp provides them with opportunities to test pedagogical ideas and theories while preparing them for a career in design education. Many graduate

students wish to explore designs impact on K-12 education, Inspire provides a venue for their research ideas and studies. This past year involved Penina Acayo, a graduate student from our program. Reflecting upon Inspire 2012, she states,

> My thesis involves creating a design education curriculum for Ugandan high schools, it was imperative that I got some hands on experience in dealing with a similar target audience such as the Inspire group of students. Inspire gave me the opportunity to observe students while they worked on projects, how they interacted with each other and how they used the information provided during the lectures for their own work. (Acayo 2013)

In summary, she was able to gain key insights on teaching this generation of high school-level students, which included: how to introduce basic design principles and terminology, dealing with a short attention span, what materials work best, constant feedback was key, critique sessions should be dynamic and engaging, and lastly, one must take advantage of how tech savvy the students are to keep them engaged.

Additionally, undergraduate students gained leadership skills while promoting community involvement serving as mentors and advocates of design. During Inspire 2012, two of our current undergraduate students gave a presentation on their decision to major in design. They spoke on transitioning from high school into the design program, their struggles and successes and future goals. This talk allowed them to vocalize their understanding and knowledge of design to camp attendees, enabling them to externalize, voice and reflect on their own educational experience.

Results

The 2012 Inspire camp included 23 high school students ranging in ages from 14–18. The students were local to the Northeast Ohio area, including one student from western Pennsylvania. The campers consisted of 5 male students and 18 female students. Inspire brought together students from different economic backgrounds and means, varying educational experiences and contrasting interests. Among these differences, one common interest of the group was visual creativity. Our goal was to unite these students and cultivate a creative community.

The students began each morning with a daily information session. Lectures given by camp instructors provided the students with an introduction to a daily project centered around a design topic (two- and three-dimensional design, photography, illustration and motion design). Students were given several goals and learning objectives for each project, yet the projects were open-ended to encourage creativity and allow for individual interpretations.

The first day was quiet, with the students appearing shy and reserved. Small group critiques were implemented on the first day. The next day, students were paired together as they went on a campus walk. Additionally, challenging them to know everyone's name by the conclusion of day two greatly encouraged student communications. These small interactions proved to be a critical step in the process of creating a space where students felt comfortable, began to collaborate and form relationships.

Within two days the energy shifted as students were social, bubbly and excited. They made friends and formed social groups for lunch and activities. Laughter and joking was heard as friendships started over sharing a glue gun and tools. Older

students mentored and embraced younger students. As instructors, we were impressed to observe the formation of an active and engaged group.

We learned that certain strategies worked best with this creative group of high school students. Similar to our college students, they wanted examples and needed to make an immediate connection between concepts and demonstrations.

> When introducing basic design principles, it's important to keep it simple or use examples that they can relate to while explaining the value of some of the principles that are not self explanatory. Following the lecture with an exercise that reinforces the principles from the lecture is key to getting them to start using thinking about those principles and how they can apply them to their own work. They will not get it right away, so always encourage students to ask questions or seek out their peers. (Acayo 2013)

Unlike college students they lacked fear of failure. Without grading and assessment they felt free to explore and engage. They tried out techniques and embraced ideas quickly. Our activities allowed them to get their hands dirty (literally) in paint, glue, wood and dirt. They made large-scale objects and small delicate artifacts. Each day they were presented with a new format and medium, but the ideas and exploration never ceased. With each project they were given ample time to test, make and create which allowed for downtime and moments of discussion and critique.

Work Produced

Our theme for the week centered around typographic letterforms. We approached each day with a different medium, encompassing the five focus areas within our School:

- Monday – 2D Design
- Tuesday – 3D Design
- Wednesday – Photography
- Thursday – Motion
- Friday – Illustration

TWO-DIMENSIONAL DESIGN

The first project focused on composition, formal aesthetics and single typographic forms. After a lecture on the history of typography and printing, students carved letters into potatoes and made prints using acrylic paint. The potatoes substituted for woodcuts as students emulated the printing process. Letters were created using provided stencils or by developing their own typographic forms, ranging from simple to complex. Students layered colors, textures, shapes, numbers and letters to create their designs. We encouraged them to produce several variations, with careful attention paid to the composition, negative space and color palette. As this was our first project, our expectation of craft and precision was loose allowing students to be free to test the material and explore its possibilities.

The second project involved using type as a basic design element, comprised of shape and form. Students were to use letterforms abstractly, rather than as a vehicle for conveying written information. After a lecture on the basic design principles (including hierarchy, contrast, repetition, use of space) students were randomly assigned a letterform. Working with their given letter, they developed a series of compositions investigating: form/counterform relationships, figure/ground studies and

scale contrast. They developed an eye for the subtlety of typographic form and the creative potential of these forms through the compositions created.

Through this project, students were made consciously aware of the design process. Emphasis was placed on design as a creative process, involving a system of analyzing and editing to come up with a solution. Additionally, we stressed peer collaboration as a key to success in their designs. Students were encouraged to walk around the classroom and interact with their peers to gain new insight on their projects. Halfway through the project we implemented small group critiques lead by instructors. Critiquing is a vital step of the design process. The small group critiques helped students see the strengths and weaknesses of their work, while stimulating peer interaction.

THREE-DIMENSIONAL DESIGN

The second day of Inspire began with a lecture on environmental graphic design and wayfinding systems. Students were given basic information including: keys to successful wayfinding, signage vocabulary and how narratives applied to three-dimensional forms. Armed with a camera and notepad, students were paired into groups for a wayfinding walk around campus. Their goal was to identify the various types of signage across our campus. The rest of the day was spent building three-dimensional letterforms. Students creatively tackled this problem using materials ranging from foam core, wood, wire and rubber bands to unconventional items including marshmallows, flowers and paper-towel rolls.

PHOTOGRAPHY

Our third day focused on photography. This allowed us to build off of the activities from the previous day as the students documented their 3D type projects. Their creations became the subject matter for environmental photography studies both outside and inside campus buildings. Additionally, students learned about the basics of photography while working with a professional photographer in the studio. They experimented with lights, depth of field and focus to create dynamic imagery.

MOTION

Thursday allowed for a change of pace as students used point and shoot cameras and cellphones to create basic stop motion animations. Students built letters through motion and transition. The motion was used to represent an action that started with their chosen letter and revealed or removed the letter using stop motion. They were given one example using the letter P, which showed an orange peeled and forming the letter using the remnants of the fruit. Students worked together to record and document their animations. Some became inventive, creating tripods with existing materials in the building. One student created a narrative in her sequence, going above and beyond the project requirements.

ILLUSTRATION

On our final day we focused on illustration and narrative compositions. Students worked with an illustration professor to create illustrations that represented their letterform as part of a simple story. Students worked with collage, watercolor, ink and pencils.

Figure 1. Students working on projects in the classroom and photography studio. Source: Inspire

Figure 2. Stills from a student's stop motion animation. Source: Inspire.

Figure 3. Examples of finished projects. Source: Inspire

Knowledge Gained

Inspire camp provided a wealth of information about younger audiences and how they approach, interpret and create design.

COMMUNITY BUILDING IN YOUNGER DESIGN COMMUNITIES

We were able to observe first-hand the development of a young design community. Creative teens built friendships and explored academic activities together. For some students, community building became their primary objective and learning was second. They enjoyed meeting other attendees, however as friendships emerged, at times they became distracted from the projects. In contrast, other students were very engaged in learning. For them, socializing was only for lunch time and group work. A select few became so immersed in their work, they worked through lunch and took projects home to complete.

The building of a design community was especially noted during the last group critique of the week. Compared to the first small group critiques where students were reserved, on the final day they spoke about their classmates work without reservation. The confidence and peer groups they gained throughout the week was apparent. They were quick to point out the successes and strengths of their peers, while also giving constructive criticism.

VISUAL PROJECT EXAMPLES AND AUTONOMY NECESSARY FOR ENGAGEMENT

Students had very different priorities and favored activities that let them be autonomous within loose objectives. With this independence, they often needed one on one discussion, either with instructors or classmates to spark ideas and facilitate ideation. Examples helped open up possibilities and gave students the jump from abstract concept to materialized artifact. Without examples most of the students would have lost time in confusion. One simple example could do more than an hour of oral explanation as it made the expectations concrete.

TIME IS RELATIVE FOR INSTRUCTORS AND STUDENTS

As our week wore on the instructors felt as though they day had been too long, lasting from 8 AM to 5:30 PM. We also worried that too much time may have been allotted for some projects. Following several discussions with parents and students we found that the students did not share our experience. They preferred the long day and felt that the extra time was beneficial in developing the projects. They also enjoyed working with other students and wanted more time in groups. Many parents praised the long day as being exactly what the students needed to experience the college campus and atmosphere.

4. TECHNOLOGY AND DIGITAL NATIVES

This generation of students are technology-savvy digital natives. The concept of digital natives was introduced by Marc Prensky and describes students who "have spent their entire lives surrounded by and using computers, video games, digital music players, video cams, cell phones and other toys and tools of the digital age" (Prensky 2001, p. 1). Throughout the week, most of the assignments were created by hand. However, when technology was involved, they embraced the opportunity. As noted by our graduate instructor, "the use of technology devices seemed to create an ease among the students. This allowed for more peer interaction as it was a commonality they all shared." Using camera phones and digital cameras, students were able to document their projects during the photography and stop motion day. When students worked in the photo studio they approached technology with comfort and little

apprehension, experimenting with lighting and shadows while working with an SLR camera and a tripod. Students with knowledge of software programs such as iPhoto and Adobe Photoshop used the programs to edit their work. Technology also fostered peer-to-peer learning, as those who were familiar with the software educated others.

Conclusion

High school students are rarely exposed to the opportunities a design education offers. With little knowledge of the design profession and career possibilities, creative students tend to gravitate towards traditional fine arts programs or abandon their creative interests. Exposing students to design at a young age is crucial for continued growth of the design discipline. In the summer of 2012, a group of high school students participated in Inspire, a summer design camp. The camp educated students about design by providing an appropriate space for experimentation and an introduction to the design practice, the profession and creative problem solving.

Inspire reached and surpassed many of the goals we established in the planning phase. One of our primary goals was to prepare students to enter higher education by building insightful portfolio projects. At Inspire, students created between 5 and 8 projects that can be included in a collegiate application from a range of design mediums. The work showcased their creative aptitude, effort, focus on craft and detail elements.

Another goal was improving student knowledge and exposure to design through mentorship. By including graduate student instructors, undergraduate student mentors and professional speakers we gave students ample opportunity to learn and engage with strong design role models. The learning lab structure allowed campers to be at the center of our community, while graduate instructors learned about teaching, curriculum development and working with young students. Inspire proved to be a positive experience and has led to new insights in educating high school students about design. The camp also served as a teaching laboratory, giving faculty a space to try new curriculum. Our graduate instructor was able to gain valuable knowledge for her thesis through Inspire, gathering research and testing ideas first-hand. Additionally, the camp made a positive impact on the student participants.

After the camp, many students indicated they planned to pursue a degree in design. Following camp anonymous surveys were conducted with the attendees. Consisting of rating scales and several short answer questions the following responses were noted: When asked about their favorite part of Inspire one student responded: "being able to learn about all the different career paths in Visual Communication Design. I also liked how we were able to have different people come in and speak to us about their careers in design." Others indicated they enjoyed the creative freedom and hearing from our current undergraduates made them want to be a designer. One student indicated that they had been focused on an out of state university for their college career. After an exceptional experience at Inspire, they were rethinking their plans and seriously considering our school. Additionally, we received word from parents of the impact Inspire made on their children. Following camp one parent writes,

I wanted to tell you again what an impact the Inspire Camp had on Peter. He loved it and really enjoyed all of the experiences with various media across the week and the interaction with the other participants. Most importantly, we feel he was actually "Inspired." He wants to pursue graphic design and it helped him see the light at the end of the tunnel with regard to his high school coursework.

Inspire is an annual event and future plans include adding an overnight option with evening design activities to the camp schedule. We plan to increase marketing throughout the region to reach a broader audience. We hope to reach more students next year and offer scholarships to those who have the financial need and creative aptitude.

References

Acayo, Penina C. 2013. "Inspire, A High School Design Camp." Field ethnography, MFA Thesis. Kent State University.

ACT Institutional Data File. 2011. *National Collegiate Retention and Persistence to Degree Rates.* Available from www.act.org

Caldwell Rinnert, Gretchen and Jillian Coorey. "Inspire Survey." Survey. *Qualtrics*. 14 August 2012. Web. 28 September 2012.

Fast Company. 2011. *Why Education Without Creativity Isn't Enough.* [cited 24 September 2012]. Available from http://www.fastcompany.com/1776388/why-education-without-creativity-isnt-enough

Ito, Mizuko and Heather Horst, Matteo Bitttanti, Danah Boyd, Becky Herr-Stephenson, Patricia G. Lange, C.J. Pascoe, Laura Robinson, Sonja Baumer, Rachel Cody, Dilan Mahendran, Katynka Martinex, Dan Perkel, Christo Sims and Lisa Tripp. 2008. "Living and Learning with New Midea: Summary of Findings from the Digital Youth Project." *The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning*. [cited October 26, 2012]. http://digitalyouth.ischool.berkeley.edu/files/report/digitalyouth-WhitePaper.pdf.

Kratcoski, Annette, e-mail message to author, August 1, 2012.

National Center for Education Statistics. 2012. *Kent State University at Kent, Retention Rates for First-Time Students Pursuing Bachelor's Degrees* [cited September 26, 2012]. Available from http://nces.ed.gov/collegenavigator/?q=kent+state+university&s=all&id=203517#retgrad

Prensky, Marc. 2001. "Digital Natives, Digital Immigrants". *On the Horizon* 9.5:1–6.

Robinson, Ken. 2011. *Out of our Minds: Learning to be Creative.* Hoboken:John Wiley & Sons.

Williams, Rick and Julianne Newton. 2007. *Visual Communication: Integrating Media, Art and Science.* New York, New York: Lawrence Erlbaum Associates.