

DESIGN FOR VISUAL EMPOWERMENT SKETCHNOTING, BREAKING THE RULES

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1. RECONNECTING THE PAST TO ADVANCE THE FUTURE

In today's world, the word "Design Thinking" has proliferated into a wide range of processes. As design's popularity grows, one must wonder "How can we make it more adaptable into the overall process?" Before getting into how it can be done, let's first observe how it breaks down in history. In pre-Socrates Greece, the understanding of wisdom, then called 'Sophia', was defined as 'the knowing hand'. Thinking and action as well as reflection and production were seen as being a whole and as being equal. Later on, in the time of Socrates, Plato, and Aristotle, Sophia was divided into the abstract (the ideal) and the concrete (practical action) as discussed in "*The Design Way, Intentional Change in an Unpredictable World*" (Nelson & Stolterman 2012). In layman expressions, wisdom has been and for the most part still is divided into thinking and doing.

Design in general and design thinking specifically conjoins these two elements. The iterative process of thinking and doing, applying divergent and convergent thinking is at the core of the design process. As such, divergent thinking refers to broadening one's standpoint while convergent thinking (and doing) narrows down to the specific. This is continuously applied during all phases from research and concept development to implementation (Hunter 2015; Kolko 2014). In order to freely move from divergent to convergent thinking or from one logic to the other, information has to be synthesized into meaningful knowledge; a skill that has to be acquired and often seems nebulous to non-designers or design novices (Kolko, 2011). Visualization techniques of various forms support this kind of knowledge creation and knowledge transfer. Applying visualization tools from low to high fidelity, designers uncover and communicate problems, identify patterns, tell stories, develop ideas, detail concepts, as well as implement and communicate solutions (Baskinger & Bardel, 2013).

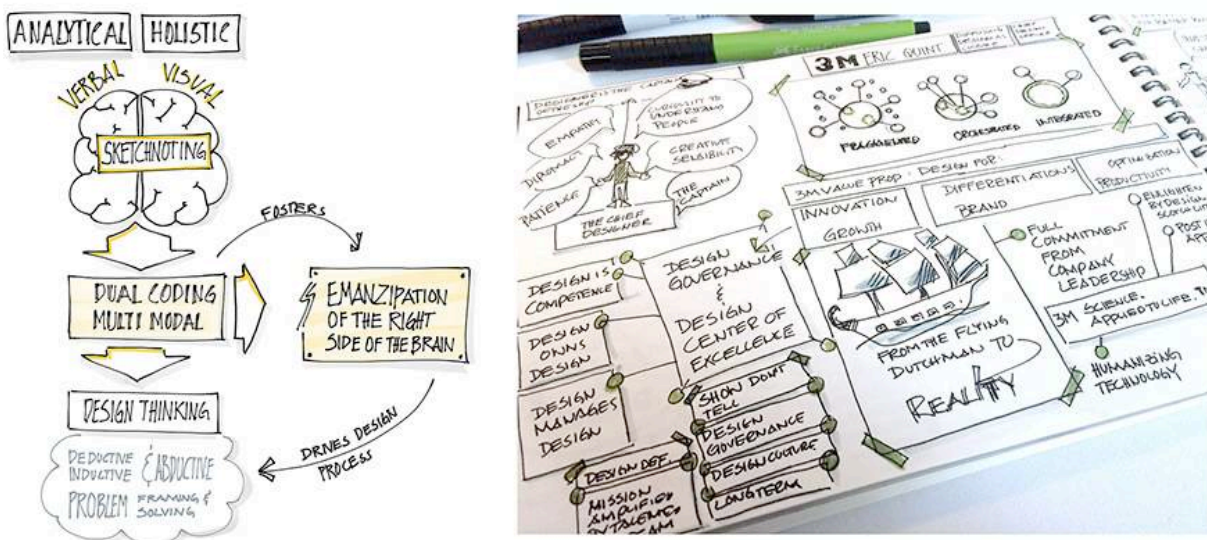


Figure 1. Left: Sketchnoting fostering deductive, inductive and abductive thinking. Right: Life sketchnote, DMI Conference Berlin 2014.

Referring back to the 'knowing hand', sketchnoting, a term coined by Mike Rohde, can be described as visual thinking and doing or visual sense-making on paper. Sketchnoting provides a framework to create visual maps of what was said, heard, and seen by "combining written words and images while providing structure through variations of frames, dividers, bullets, icons, and connectors such as arrows and lines" (Rohde, 2013). Due to its simplicity and low complexity it can be learned fairly quickly. Compared to traditional note taking styles where words and bullet points are confined to the ruled lines on a page, sketchnoting is a more dynamic and visually engaging way of capturing information and thus disrupting the way notes are captured. Sketchnoting provides a methodology to visually synthesize complex information during lectures or meetings and equally important during project planning or idea generation in both individual and team settings (Paepcke-Hjeltness, Mina & Cyamani, 2017). It can be argued that through combining visuals and words sketchnoting applies dual coding (Pavio, 1990), thus fostering better retention of information when turned into study notes. Live sketchnotes are often a bit cluttered (figure 1, right) and can contain spelling or content mistakes, which the sketchnoter usually integrates into the overall visual representation. In addition, many sketchnoters create their individual visual library of shapes, forms, icons, images, and arrows to draw from for efficiency.

There are ample sketchbooks on the market, lynda.com tutorials, and classes offered in design related programs, community colleges, and the like, which teaches how to draw. Yet there still seems to be an opportunity space at the lower end of the visualization spectrum for an alternative approach going back to the roots of thinking on paper. The research is driven by the hypothesis that sketchnoting can be an alternative entry point and motivational tool to develop sketching, creativity, and most importantly design confidence. It can also help foster knowledge transfer, visual synthesis, and divergent/convergent thinking which are all essential aspects of the design process. This paper shares insights from expert interviews regarding the importance of sketching and discusses two approaches of implementing sketchnoting in two different industrial design programs with a focus on how students integrate it in their day-to-day practices and how it can prepare them for their future employment.

2. EXPERT INTERVIEWS ON THE STATE OF SKETCHING

In order to gain insight into the importance of analog sketching, the research team conducted email interviews with three established design experts. One of the experts is a historian, publicist, and researcher who has first hand exposure of student work submitted to a design competition spanning over the course of 25 years. The second design expert is a British designer who, for the past 20 years has been the president (and founder) of a global design consultancy, which has its origin in Germany. The third expert had been in the design industry for more than 20 years ranging from automotive to furniture design, before becoming a leader and driver in the academic world at two different institutions. All three experts point out that although sketching is a very important and a relevant tool in the design process, the overall ability for analog sketching among graduates has been diminishing. One of them pointed out that schools are putting less emphasis on sketching than in the past. Some students graduate with almost no sketching skills and often replace it with digital skills instead. All of them concur that broadening the design spectrum encompassing more in-depth research and design strategy over the years has had significant influence on this development.

One of the experts shared a crucially important and not to be underestimated point: "...*designers increasingly find themselves in multi-function/multi-disciplinary environments, the person with the drawing skills will be the focus of attention in the room. That's a position of power at the decision-making stage. The person who controls the pen guides the discussion.*"

It seems, however, that some design curricula miss out on this opportunity. A survey among current students with more than 100 responses shed light on the realities of sketch confidence. Only 50% of the students in this survey considered themselves being on the higher end of sketch confidence (on a scale of 1-5, with five being highly confident) 46 scored themselves a '4', only seven scored themselves as '5', Only a fifth of these students are in their senior year.

This research team sees an opportunity to change the trend of the diminishing role of sketching in design education by fostering sketchnoting as a gateway to sketch and creative confidence, team collaboration, visual communication, and knowledge transfer.

3. SKETCHNOTING AT ACADEMIC INSTITUTION: IOWA STATE UNIVERSITY

Over the past 2.5 years sketchnoting has been taught on a regular basis to students in the industrial design program in both workshop and course settings. All in all, approximately 300 hundred students were reached from sophomore, junior, senior, and to graduate levels. The workshops were either set up as one-hour or three and a half hour sessions of selected learning modules and hands-on activities. The focus of the sessions varied from sketchnoting as a visual note-taking tool to sketchnoting as an idea generation framework (Paepcke-Hjeltness, Henry, 2017). The latter was specifically geared towards team communication as a way to visually frame problems together. In addition, these workshops focused on sketchnoting as a means to rapidly explore ideas together on paper.

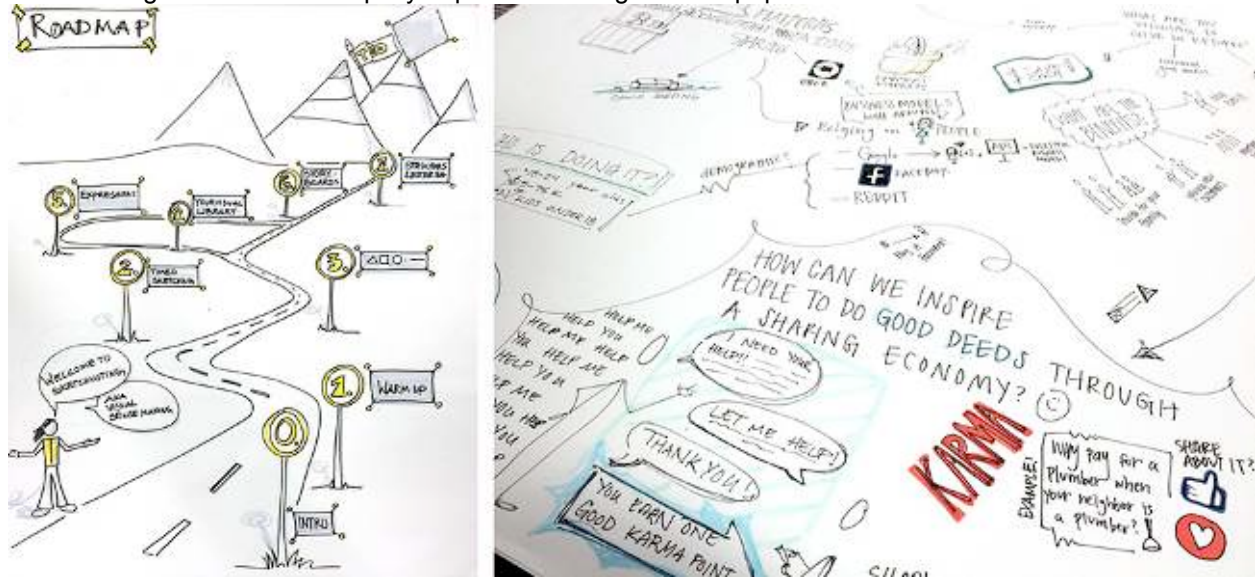


Figure 2. Left: Roadmap of basic sketchnoting session. Right: Research team's exploration of the sharing economy as a joint sketchnote.

The basic sketchnote learning modules were inspired by a workshop conducted by Eva-Lotta Lamm at the IFVP (International Forum of Visual Practitioners) conference in Berlin, Germany 2014. "Bikablo", a visual handbook developed by the Kommunikationslotsen agency in Germany, and elements from Mike Rohde's "The Sketchnote Handbook" were the backbone of the visuals taught in these sessions (Rohde, 2013). Sketchnoting was also introduced in a graduate level course on Visual Communication in Industrial Design focusing on visual storytelling, visualization of complex systems, and idea generation. This broad implementation led to several opportunities for research and further exploration of sketchnoting as a methodology (Paepcke-Hjeltness & Cyamani, 2017). Recently a formal investigation was conducted exploring the effectiveness of sketchnoting to promote student learning and engagement in large-scale design lecture courses. The outcomes were presented at the National Conference of Undergraduate Research (Garwood & Dhadphale, 2018). Although the original intent for sketchnoting was to create more meaningful and engaging meeting or lecture notes, sketchnoting turned out to have much larger applications and implications which will be discussed here.

3.1 THE ROLE OF SKETCHNOTING IN THE DESIGN PROCESS

Out of 59 students who responded to a survey, 39 use it for study and lecture note taking. However, a total of 49 students use sketchnoting as an idea generation tool. Among those, almost all use it during the entire design process either for research, ideation or both. Students have integrated it with great success in research analysis, visualization of complex data (such as secondary research) contextual observations (evolves into behavioral maps), and stakeholder and persona development (figure 3, junior level studio course).

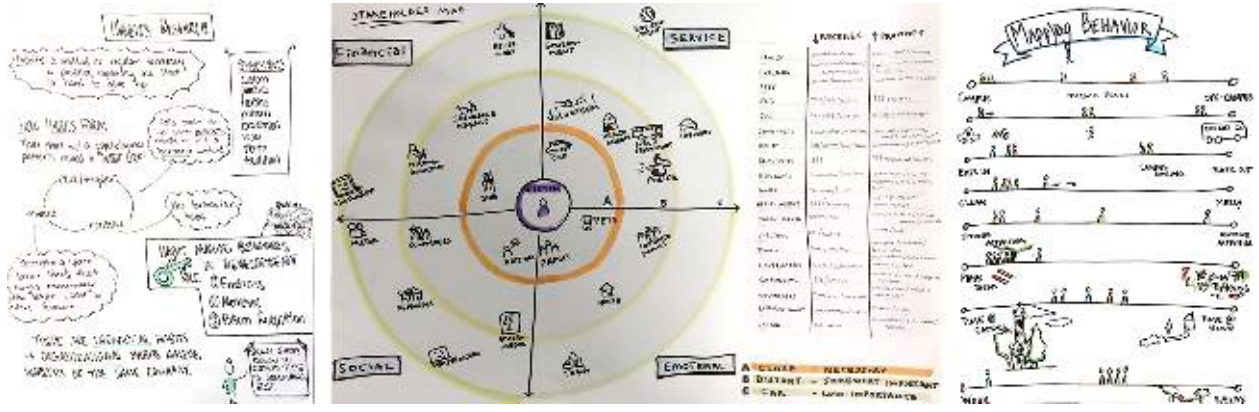


Figure 3. Left: Summary secondary research. Middle: Stakeholder map using Smapply template. Right: Behavior map for persona development.

Many students use it early in the ideation process while exploring high-level concepts. Often, they are asked to develop a high number of ideas sketched on simple sticky notes to allow for later affinizing as well as to avoid bias and fixation. However, with slightly increased fidelity and the addition of perspective simple sketchnotes, it can turn into more detailed concept explorations (figure 4, senior student). This form of sketching allows for consistency in visual communication while maintaining a rapid form exploration process. From this step, the sketches can easily be digitized then converted into outlines finally rendered for more detailed and photo-realistic aesthetics.

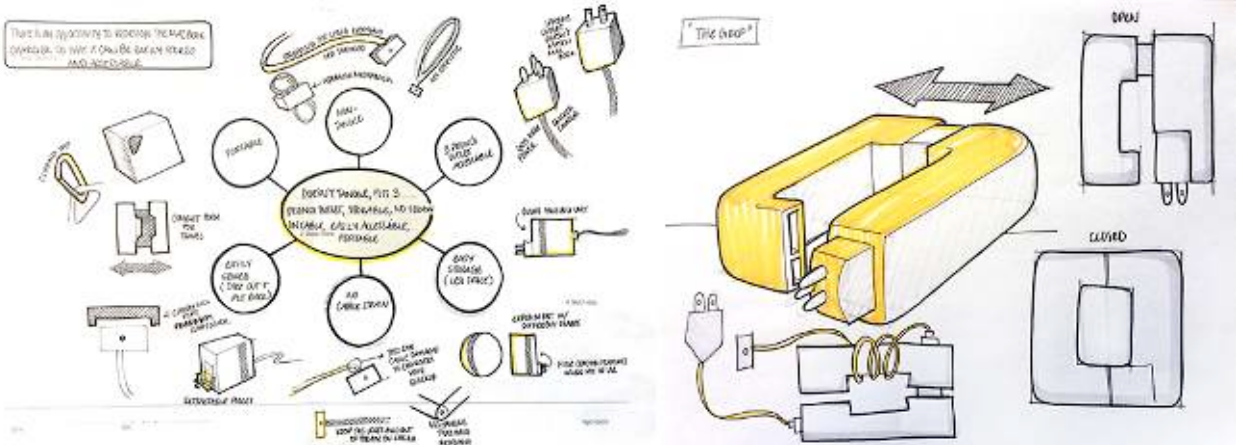


Figure 4. Left: Sketchnoting using a rapid ideation template. Right: Moving into perspective for exploration of form-factor.

In addition to the more traditional note-taking type of sketchnotes and the incorporation into the design process, students are using sketchnoting to organize ideas, create lists, use it for project planning, and layout exploration. In an attempt to facilitate and organize complex contents for poster designs, templates were developed using storytelling elements encouraging the use of sketchnotes for early conceptualization (figure 5).

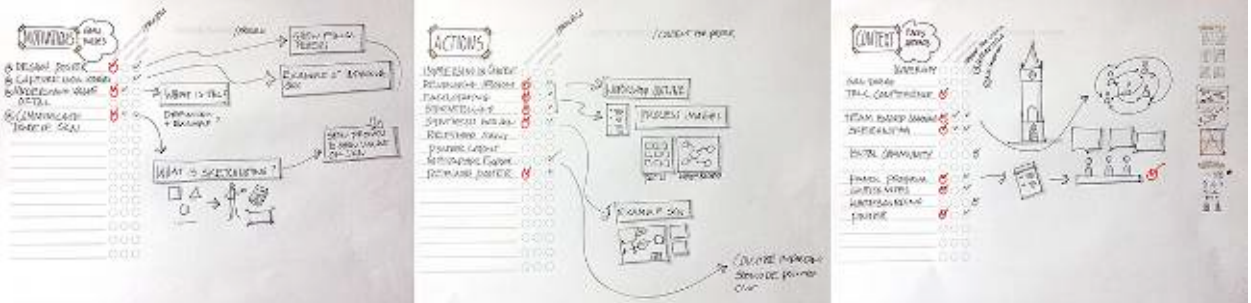


Figure 5. Sketchnote templates for poster content development.

In the survey, students pointed out that sketchnoting supports learning and reflection, gives their thoughts and ideas structure, and that it can help them improve their sketching skills. There is a consensus that sketchnoting supports knowledge transfer across disciplines and that it would be beneficial to integrate it into children’s learning. Something Mike Rohde has been successfully doing with his workshops on ‘Teaching Sketchnotes to Teachers’ (Rohde, 2018).

4. SKETCHNOTING AT ACADEMIC INSTITUTION: PURDUE UNIVERSITY

During a similar timeframe, sketchnoting was introduced at a different institution. This instructor brought the sketchnote methodology to a course after having used it successfully for several years while working at a major design consultancy in Chicago. Observing how sketchnoting proved to be a powerful visual communication tool in practice (effective in client meetings big or small) the instructor decided to introduce it to a sophomore design sketching class where the responses were overwhelmingly positive. After the exposure, one student pioneered it and started not only sketchnoting in class, but also during presentations, meetings, and workshops around campus. The student adopted the skill into his lifestyle and changed the way he absorbed and translated information, which resulted in more efficient group meetings, better grades, and an increase in the retention of information. The adoption of this new technique allowed the student to break out of the lines of his paper thus liberating his creativity for learning. It gave him permission to experiment and think of new ways to document information, which reframed his view on learning. For him, learning became more fun and sketchnoting was his new strategy for growth.



Figure 6. Left: Class notes before learning sketchnotes. Middle: Class notes after learning sketchnotes. Right: Class notes for math class from another student who learned sketchnotes

4.1 THE POWER OF STUDENT LED LEARNING AND TEAMWORK, SKETCH SQUAD

What began as a way to help students take more effective notes, soon evolved into something larger. Based on the growing interest from students, the sketchnoting student organization, Sketch Squad, was born. Sketch Squad focuses on creating visual notes to help make ideas come to life. The key to the success of this student group was due to its professional tone and branded appearance, which gave the students a sense of professionalism and a platform to practice and share their sketchnoting experiences.



Figure 7. Students sketchnoting in teams.

As a result, the increased popularity of live sketchnoting (AKA graphic recording or graphic facilitation) to document presentations has shown people the power of live sketching on the school campus and beyond. Students started practicing live sketching to help capture content at conferences, events, and discussions. A major challenge was overcoming the fear of live sketchnoting. In order to ease the situation, a team-based approach was introduced. Students would work on giant foam core boards as a team with individual roles. (figure 6, 7).

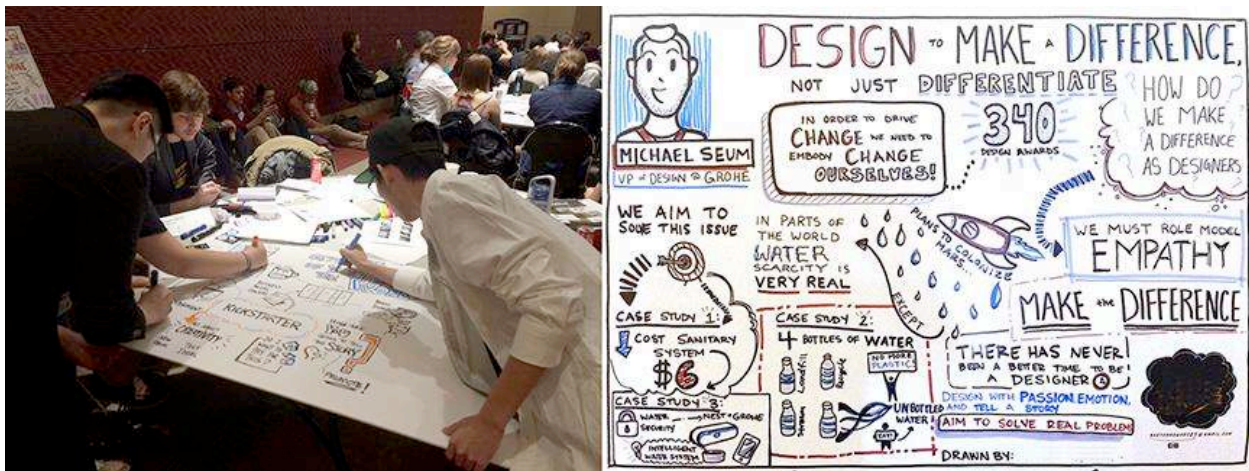


Figure 8. Left: Live Sketchnoting at conference. Right: Live sketchnote.

What started as a double-teaming dynamic, soon organically evolved into a swarm of 3-8 students tackling one board and working in concert with one another by dividing up the tasks. The process, solely developed by the students, originates with one person capturing the content on a small notebook. This information is passed on to the next student who draws out the overall framework showing the main information visually. A third student uses color to create visual hierarchy by highlighting information, connecting content, and bringing emphasis to what's important. Their markers dance around on the board, depositing layers of ink with speed and creativity.

In an interview conducted with the students one pointed out: "It's good for ideation because I developed a lack of care about how neat my sketches need to be". For the Sketch Squad students, they not only felt more confident in their sketching, but they also talked about how this new skillset gave them an "edge" during interviews and networking events. One student said, "During interviews and portfolio reviews people saw that I could do CAD, sketch, ideate, but when they saw that I can sketchnote, they were like 'Wow, that's super cool! Tell me more about that!' So it gives me an edge". A large number of students agree with the social confidence this has given them and they see this skill as an opportunity to stand out.

During professional networking events, students tend to be timid and feel intimidated to talk to professionals. However, after being exposed to sketchnotes they would often leverage their experience with sketchnoting as a way to break the awkward social tensions. This was particularly helpful for the Sketch Squad student team that would sketch during a conference and then partake in the networking party afterwards. Their exposure to the audience during the presentation gave them an edge when connecting with people during social gatherings.

5. EMPOWERED THROUGH SKETCHNOTING

Overall, the research team sees a major opportunity for sketchnoting to play a much larger role in design education beyond being a visual note-taking tool. The successful yet different implementations and applications of sketchnoting at both institutions explored its versatility building on the shoulders of the pioneering work by Rohde and designers such as Eva-Lotta Lamm. In addition, the expert feedbacks confirm the importance of the craft of analog sketching ability.

Through the low fidelity approach of sketchnoting, the inhibition threshold of putting pen on paper is lowered. The visual representations create a sense of contentment for the sketcher. With little practice, sketchnoting seems to provide an almost immediate satisfaction of being able to communicate on paper. Especially in design education this can break the vicious cycle of avoiding sketch practice by lowering the threshold to more complex visualization techniques as used in Industrial Design, Architecture, Interior design and the like, thus fostering sketch confidence.

Sketchnoting has been successfully used to explore and visualize problems as well as to develop high-level concepts; both, individually and in team settings, hence, it can be seen as a problem framing and idea generation framework. Acquiring visualization skills to communicate ideas freely and easily without fear of imperfection and mistakes is the first step to trusting one's own creative ability (Kelley & Kelley 2013). This can be practiced when sketchnoting in various settings such as in team sketchnoting at conferences and talks. Once sketch confidence is established, the creative flow happens much more freely, encouraging collaboration and triggering unexpected and disruptive ideas.

With a nod to 'Sophia, the knowing hand' (Nelson & Stolterman 2012) sketchnoting might have the ability to promote all modes of thought processing; inductive, deductive, and abductive thinking (Martin, 2009). due to its use of words and images, divergent and convergent processing. Sketchnoting supports to not only put more and diverse ideas on paper quicker, it also supports visual synthesis of complex information. Both greatly aid in the design process and can influence overall design confidence. Most importantly, as mentioned above, sketchnoting instills a confidence in students that goes beyond mere sketch confidence. It not only gives them an edge in job interviews, but it also empowers them, such as during networking events. By learning the process of Sketchnoting, it can help them to grow into well rounded, fearless designers who think, and visually communicate in fast paced, at times intimidating environments.



Figure 10. Left: Live Sketchnoting at conference. Middle: Group picture with event organizers. Right: Group picture with keynote speakers.

5.1 A CALL FOR ACTION

The vision is to break the “rules” of current note-taking methods and elevate not only design thinking but education in general by introducing sketchnotes as a new process for students to capture and transfer information. The first step is to grow Sketch Squad by forming chapters across the Midwest and beyond

with the aim to share best practices, laying the groundwork for a sketchnoting network, which can grow beyond the educational environment. With the aid of this network organization, the graduates can continue to disrupt, gain confidence, provide a service to their local communities, and share their expertise.



Figure 11. Left: Live Sketchnoting at workshop on how to create sketchnotes. Middle: Outcome from workshop Right: Guest speaker event via live streaming for weekly training sessions

We anticipate for these graduates to be more skilled and experienced and more fitted towards fast paced professional workflow with an agile design process and the ability to break down information complexity visually and transfer knowledge between disciplines with ease. By spearheading sketchnotes as a skill to create sketch confidence, hopefully we can counteract the trend of the diminishing sketching skills and uplift the world of education and raise the industry into a new level of 21st Century creativity.

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