SYNC IN PROGRESS

Connecting the Technology Gap Between Gen Y Students and Their Professors

A thesis submitted to the School of Visual Communication Design,
College of Communication and Information
of Kent State University in partial fulfillment of the
requirements for the degree of Master of Fine Arts

by
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I’d like to express my sincere appreciation and gratitude to the many individuals that benefitted the development of this work, my graduate experience and education. To the Visual Communication Department at Kent State; Professors, staff, fellow graduate students, undergraduates and the Director, thank you for providing a challenging education which drove me to acquire new skills. I’d like to thank my parents and family for their consistent support and cheering. The stream of encouraging emails, cards, phone calls and visits were so impressive. To John, thank you and I love you.
In 2009, Jennifer Visocky-O’Grady, Graphic Design Professor and Chair of the Art Department at Cleveland State University, delivered a project to her ART 444 class with one task in mind. We were challenged to research the Millenial generation and NASA, as the space organization had experienced difficulties reaching the youth audience. Following weeks of research and design prototypes, we presented our final work. This experience led to a pilot program design position with NASA where I continued developing educational tools for adolescents through focus groups, surveys, research, copywriting, and designing. As I developed the work, I became increasingly passionate about wanting to connect with the young audience and produce materials which empowered them to seek careers in STEM (Science, Technology, Engineering, and Math). More importantly, I wanted the Millenials to foresee a future where they have the ability to define its identity. Since the summer of 2010 I’ve continued studying Millenials, seeking to understand their characteristics as a means to inspire them.

From that singular experience of an undergraduate project, and the supportive encouragement of Jenn Visocky-O’Grady, I’ve discovered a true passion for research. My thesis has carried the research torch further: delving deeper into conducting extensive studies, exploring qualitative and quantitative methods, group collaborative efforts, building research strategies and projections, and seeing the impact design can have on social advocacy initiatives.
CHAPTER I: INTRODUCTION

The Millennials are a group, born from 1977-1994, that have experienced great technological advancements during their formative years as children. Cell phones, computers, the internet, social networks, video games, ipods, digital tablets, and GPS have impacted their lives in big ways. This unique aspect to their youth has resulted in distinctive generational characteristics; they are tech-savvy multitaskers, independent, and worldly. They also have formed expectations in what they wish for with their education, both in tools offered and delivery methods used by educators. This presents many challenges for educators to stay abreast of technological advancements as they are implemented in classrooms, as seen by the adoption of tablet technology across the nation.

Tablets are quickly replacing traditional textbooks as school systems see new opportunities to save both districts and students a high financial savings. As tablets replace textbooks, educators are often left without proper training to understand the full capabilities of this new tool. A generational, societal, and cultural gap between educators and students will continue to widen if this area is not researched. Tablet based educational materials must meet a criteria that educators feel comfortable implementing, and students feel engaged by its design. This thesis sets out to understand the Millenial generation and develop an educational tool that harnesses aspects of their technological culture as a means to engage them as students in new ways.

In addition, the format and delivery method of textbooks have remained untouched for decades. Educational materials no longer need to resemble a traditional textbook as they make the leap to a digital platform. Tablets need not remain a digital version of a book. This new technology presents vast opportunities to present the same educational materials with multiple learning styles, an interface that connects multiple course subjects in their relevancy, place it contextually in history, and place the audience as the authors themselves (similar to Wikipedia). Generation Y’s characteristics also demand the development of new concepts in
regards to the presentation of educational materials. Engaging an audience that is familiar with juggling multiple devices and platforms must be considered as tablets are implemented. According to the most recent U.S. Census statistics on Generation Y, math and science scores are rising but the Scores from the 2009 Programme for International Student Assessment rates 15-year-old students in the U.S. performing about average in reading and science, and below average in math. Out of 34 countries, the U.S. ranked 14th in reading, 17th in science and 25th in math.

Research is necessary to reveal the cognitive development and media usage habits of students in regular educational settings to then apply this information towards the production of a solution. In addition, the instructional techniques and technologies used by teachers will provided key analysis as a means to develop a tool conducive to both audiences. Tablet based educational materials must meet a criteria that educators feel comfortable implementing it, and students feel engaged by its design.

The implications of this research will provide a foundation for continued development of educational tools in the classroom. As stated previously, this work will provide key analysis of Generation Y, the ‘gap’ between the generations, and how to effectively reach these new consumers in modes they are familiar with and comfortable to use. The prototyped solution is a result from the research of its users, both with students and faculty.
While conducting this thesis study, it takes precedence to note the creation of a longitudinal projection model developed from the collaborative work with fellow colleague, Aimee Crane, while conducting another research investigation. During our joint work, it was necessary for us to review our research methods from a broad scope overview. Following an extensive literature review, we wished to examine the entire strategy of the study before conducting any primary research. This model developed quickly as there were strategic questions associated with every method we considered.

This projection model can be used as a tool to efficiently maneuver through a study, permit quick adaptations to strategies if necessary, and demonstrate the study in its entirety with quick precision. Following the creation of the model, Kent State University’s Visual Communication Design graduate program adopted the projection model due to its universal application and relevance in conducting research. Aimee and I encourage researchers to appropriate this model in future research investigations. Please see figure 3 for the projections model associated with this study.

Observing a pattern within the longitudinal projections model led to the development of a visual map. While applying the model to several investigations, a theory on research patterns grew. Upon wanting to examine this theory further, a visual map was created. The map demonstrated a longitudinal direction, read from left to right, with secondary research examined before primary research. Overlaps on this map prepare a researcher to source participants in regards to multiple methods, ensuring efficiency in a study. This map has been instrumental with additional investigations. Please refer to figure 2 for the projections visual of this study.
**Literature Review**

**PURPOSE**: Perform a broad Secondary Research foundation for the study

**ACTION**: Case Studies, scholarly articles, journals, blogs, documentaries, newspapers, publications

**OUTCOME**: Analyze national studies and statistics of Generation Y and the introduction of iPads into classrooms

**Contacts**

**PURPOSE**: Form committee

**ACTION**: Select three members to assist in guiding the thesis

**OUTCOME**: Committee members to provide specific feedback
**Survey**

**PURPOSE:** Collect general feedback from students and faculty on use of current educational tools

**ACTION:** Inquiry into students’ study habits, current use of educational materials, what technology(s) are at their disposal, and their familiarity with technology.

**OUTCOME:** Gain insight into student’s use of current educational tools, habits with those tools, and desire for new tools.

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**Observation**

**PURPOSE:** Document accounts of study habits and technology use while studying

**ACTION:** Attend Classrooms, library, study groups, Faculty offices.

**OUTCOME:** What factors contribute to technology use in educational settings? Do students use technology when studying? How often? Do faculty know how to use the technology provided to them for class instruction? Do they utilize all the tools at their disposal?

---

**Interviews**

**PURPOSE:** Ask specific questions not permissible in a survey and not documented through observational techniques

**ACTION:** Conduct interviews with students and faculty, 5-8 from each group

**OUTCOME:** What factors contribute to technology use in educational settings? Do students use technology when studying? How often? Do faculty know how to use the technology provided to them for class instruction? Do they utilize all the tools at their disposal?

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**Analysis/ Brainstorming**

**PURPOSE:** Cumulative analysis of research

**ACTION:** All Primary and Secondary Research, Research Projection Model Personas, Research Projection Map

**OUTCOME:** Identify areas of opportunity. How might we? or similar, concise focus
Prototype
PURPOSE: Design tangible, effective, sustainable solutions. Develop navigation
ACTION: Roughs, Narrow selections, Fine tune, Revise
OUTCOME: Findings drive VCD prototype

Prototype Testing
PURPOSE: Test validity of visual communication design prototype
ACTION: Feedback from developer, students
OUTCOME: Identify areas to improve design

Final
PURPOSE: Share research, findings, and offer solutions
ACTION: Research summary document, prototypes, Findings, write thesis, journal submissions, conferences
OUTCOME: What factors contribute to technology use in educational settings? Do students use technology when studying? How often? Do faculty know how to use the technology provided to them for class instruction? Do they utilize all the tools at their disposal?
An extensive literature review was conducted on the American generations of the last century, education, technology development and its use in classrooms. Case studies, scholarly articles, books, journals, and websites were poured over to gain a broad understanding. A few pieces of literature on Millennials rose to importance beyond any other published material. These include American Generations: Who They Are and How They Live 6th Ed. and The Millennials: Americans Born 1977 to 1994 3rd Ed., both pieces by the Editors of New Strategist Publications. The authors base their data visualizations on information collected from several branches of the government: the Census Bureau, the Bureau of Labor statistics, the National Center for Education Statistics, the National Center for Health Statistics, and the Federal Reserve Board.

Furthermore, naming conventions and time stamps assigned to each generation are widely contested by demographers. Criteria for categorizing human populations are based on societal, religious, cultural, geographic, educational, and psychographic variables. The most widely accepted generational categories are used here. This thesis will not contribute to debate over the generations, but definitions will be used for clarity. The groups which impact this study are classified as the Swing Generation, Baby Boomers, Generation X and Millennials.

The Generations

The Swing Generation is smaller than the generations that surround it— the older World War II generation and the younger Baby-Boom generation. Though the birth rates dropped immediately following the Great Depression, women entered the workforce in great proportions, and leaders of social movements in the 1960’s and 1970’s were members of this generation (New Strategist Editors, 2008, p. 23). This group only accounts for 9% of the population today.

The Baby Boomers are the largest generation in American history at 77 million.
Because of their size, the group has been the center of business and media attention for the past half-century. As the group ages, the healthcare industry is now growing to meet their needs. The generation accounts for 25% of the population, with the youngest member being in their forties (New Strategist Editors, 2008, p.18).

Gen X is naturally overshadowed by the generations on either side of them— the Millennial and Baby Boom generations. The group accounts for only 16% of the population, numbering 49 million. Gen X’ers are now the nation’s parents, and they are entering their peak spending years (New Strategist Ed., 2008, p 13).

The Millenials are the return of a big generation, as the Baby Boomers were. They account for 76 million individuals, or 25% of the population. As of today, the oldest member of the generation is 33 years old, and the youngest is 18. This generation’s characteristics consist of being tech-savvy, global thinkers with great optimism.

*Factors which impact this work*

Gaps exist between the generations as each group has experienced different factors which form their identity. The gaps that exist fall under education, technology ownership and usage. Millenials have expectations associated with their education, and technology plays a big role in it. In addition, behavioral differences between the generations are causing a great divide. The behavioral differences between the generations have contributed to teaching methods which don’t fully connect with the characteristics of the Millenials. Opportunities exist for both student and instructor to reach a consensus of engagement, enthusiasm, and connectivity in education.

*Technology*

Millenials have grown up in a time where technology has boomed. The home computer not only became a reality during the 1980’s, but schools adopted the devices as well. During the formative years of the Millenials, home computers replaced word processors,
cell phones replaced land lines; and music has transitioned from records to mp3’s. The mobile music device now reigns supreme. In the last 5 years, multi-touch screens like iPhone, Droid, iPad, and Kindle have changed the way we interact and use technology. According to the Pew Research Center’s study on Generations and their gadgets, Millenials not only own all the technologies listed in their investigation (cell phones, desktop computers, laptops, MP3 players, game consoles, e-Book readers, and tablets), but they access a wider array of their functions. Cell phones are used for picture taking, emails, web searches, and app functions. The demonstrates devices are quickly becoming the housing unit for many uses.

Millenials demonstrate a need for portability with their technology as well. As opposed to previous generations, the laptop has risen in importance over a desktop computer. The statistics of laptop and desktop ownership literally flip between Millenials (70% laptop, 57% desktop) and Gen X (61% Laptop, 69% desktop). This trend will grow with the debut of more portable devices like tablets. Remarkably, the only area where Millenials do not dominate the ownership of devices are with tablets. The younger portion of Baby Boomers have adopted the technology above all others.

With the use of technology our access to information is changing too. Emails, text messages, and online news articles deliver information in compartmentalized sound bites digestible to the fast paced, multi-tasking world we’ve grown accustomed to. Millenials especially have grown to have expectations for the structure in which information is delivered. According to Read It Later, their data explains the difference between iPhone and iPad usage. We can see from Tables 2 and 3 on page 18 that the devices vary in their time usage. Many tablet owners state they use the device for media–watching movies and reading articles. Cell phone users are using this device mostly for communication–text messaging, emails, phone calls.

Tablet technology has largely effected education. Tablets have presented an opportunity to effect the portability of educational tools and the interactivity associated with it. Apple is a corporation that has made a considerable impact in the education industry. Their
innovative work has reached beyond their initial identity as a desktop computer company, to disrupt the music, movie, and book markets. More so than their competitors, they have established a vested interest in education. This can be stated with such certainty by the overwhelming adoption of iPads into school systems around the U.S. Apple has also formulated a purchasing system with iTunes, iTunesU, and iBooks. The quick access and instant gratification of acquiring materials from these sources aligns perfectly with Millennials desire for technology.

School districts are equally aggressive in implementing tablets as replacements for textbooks. According to Newsweek.com, Kentucky is giving an iPad to every student in the entire state. Projections expect 600 school districts to give each student an iPad in at least one class. According to IDC, a leading market research group, iPads and Kindles are expected to reach a shipment of 106 million in 2012. This percentage is a 54% increase from 69 million

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Source: Pew Research Center’s Internet & American Life Project, August 9-September 13, 2010 Tracking Survey. N=3,001 adults 18 and older, including 1,000 reached via cell phone. Interviews were conducted in English (n=2,804) and Spanish (n=197). These findings are based on a survey of 3,001 American adults (ages 18 and older) conducted between August 9 and September 13, 2010. The margin of error is +/- 3 percentage points. Interviews were conducted in English and Spanish, and the survey included 1,000 cell phone interviews.
shipped in 2011. The National Publishing Group has partnered with California State University to offer its students interactive digital textbooks at $49. Even locally, the Cleveland Institute of Art has given every student and faculty member an iPad for the 2012 school year.

With the introduction of the newest iPad3, the older version is cheaper and more families are purchasing the tablet for their children (Yu, 2012). Outdated iPads are also being castoff to youngsters, most notably under 5 years of age. This will certainly play into the development of the generation following the Millennials.

The incentives to purchase an iPad have grown considerably as the computer giant has introduced iBooks, iBook Author, and Textbooks. iBooks is an online source, similar to iTunes which permits 24 hour shopping of various book titles. The purchase is instantaneous and provides qualities unique to using a tablet. The digital book is immediately uploaded to the user’s bookshelf of titles. When accessing a title, tools permit the user to flag the page, impact the size and font of type, and change value settings to day or night use.

Textbooks expand on the digital platform by introducing interactive features with the new medium. Mike Matas of Push Pop Press delivered the first interactive features of a digital textbook with Al Gore’s ‘Our Choice’. The book delivers geo-marked photography, interactive graphics, animations, several navigational tools, video, and audio narration. The introduction, which can be seen at pushpoppress.com demonstrates the unique qualities of the design. A year after this technology was introduced, Apple exhibited interest in education again by offering iBooks Author for free. This app allows anyone the possibility to structure a
textbook with the same features as ‘Our Choice’.

Research on note taking in pedagogical settings has received considerable attention. However, the awkwardness of integrating information across different media formats may present physical and cognitive barriers that prevent students from effectively organizing annotations from both printed and digital content while studying paper textbooks (Yu, 2010). iPads have not offered a solution to Yu’s observation. The platform segments learning by compartmentalizing information. Primary research conducted for this thesis continued examining this statement by Yu in an effort to diminish or eliminate physical or cognitive barriers.

**Publishing**

Adaptations to technologies have not only effected education, but now have effected the publishing industry. With the creation of iBooks Author, anyone can publish a book, and without the backing of a publisher. Apple can post the published work online and the author can assign a cost for the piece. Universities and organizations like Edutopia have also joined the ranks and have added titles to iTunes U with free audio, video, and literary tools. Many items are presented in short 6 minute presentations, again, succinct with the qualities of Millennials.

The synopsis of all this information is not if tablets will impact education, but they have and will. The question remains, what opportunities exist with the device? How can it meet the needs of its users? Varied generational differences will impact the development of tablet applications, another is the structure of education itself.

Disrupting the commercial system of publishing books is key to providing students with materials which meet their needs (Christensen, 2008). The business model of publishing textbooks does not account for digital texts which cost considerably less than their paper counterparts. The approval process associated with developing a text is equally as mandated. According to Christensen, only a few authors contribute to the creation of a text, and development is limited to certain learning styles. Adoption decisions by state and local administra-
tors even govern the implementation of the new texts. It’s a cyclical process which caters to certain architectures of knowledge, dependent upon the subject. As an example, an expert may have sought to study the discipline of math because he thinks in a logical manner. This individual will write the book, catering to a logical style, thus only impacting students with a similar strength. This limits the successfulness of reaching many students, which vary in learning styles. According to Gardner, who identified eight different intelligences, we learn in a variety of ways (fig. 7). Tablet technology can implement different learning styles as best to serve the needs of the students.

The arduous process of school districts adopting new texts slows the influx of current information. Many times, by the moment a book has reached a student it’s already outdated by two or three years. Based on Christensen, we must disrupt the system to impact education. His book outlines the theory of restructuring school districts, and focusing on student-centric learning. Reading this literature greatly impacted this study as the argument in Disrupting Class was very concise. There are lessons from other industries where a corporation has literally disrupted the norm. Apple is a great example of this with iTunes. Prior to debuting iTunes, Apple was not founded in the music industry. They saw an opportunity to disrupt the market and introduce a new way of offering music. Their investment has made such great impact that CD’s are all but outdated now. This same impact could occur with the adoption of educational tools. Christensen outlines developing a tool that students adopt because of its unique qualities, and by increased usage with students, school districts will have no choice but to adopt it. In a sense, it’s entering through the back door. This thought will have great impact on a prototyped solution.

Christensen also describes a theory of developing student-centric style textbooks. These books would share a peer interactivity as a means for students to learn from each other. Christensen sees this as the future of education. This thought would later prove to be pivotal in this thesis.
Education

Following a restructuring of the governing bodies over schools, careful attention was paid to teaching methods which partner with implementing technologies and the characteristics of the Millenials. Extensive research was conducted into the development of students; active and flip learning. Arguments can be made for each style having its relevance and as a designer this can be reaching beyond my scope, yet their are opportunities for educators to review these styles. They appear to connect well with a Millenial's need of transparency and global thinking. In active learning, the students are a part of the learning process, contributing to each others education. Rather than lectured to, a discussion places the emphasis on peer based learning. According to Roehling (2011), this places a responsibility on the Professor to be open in conversations and engage the students through enthusiasm. Millenials want to feel prepared for the discussions, so it is necessary to deliver clear expectations of their assignments. Developing a environment that is comfortable, and inclusive of Millenials contributions to learning will result in a vocal, engaged group dynamic.

Flip learning truly bases its structure on technology as a supportive tool to a student’s education. Rather than spending class time to deliver lectures, these materials are assigned prior to classroom discussions on the matter. This quickens the cognitive development of students because of the effective use of class time.

Other sections of the literature review surrounded researching additional learning styles, intrinsic learning, promoting community and creativity in the classroom, and additional characteristics of the Millenials. These will be inserted within the Primary research where their relevance is apparent. Secondary research was conducted consistently during this study due to the rollout of iBooks, iBooks Author, Textbooks, and the new iPad3. It was pertinent to remain up to date on a daily basis as many developments impacted this study. The extent to which literature played in structuring a research strategy was paramount.
**LOGICAL MATHEMATICAL:**
Ability to calculate, quantify, and consider propositions and hypotheses and perform complex mathematical

**SPATIAL:**
Ability to think in 3-D ways; perceive external and internal imagery; recreate transform, or modify images; navigate oneself and objects through space; and produce or decode graphic

**NATURALIST:**
Ability to observe patterns in nature, identify and classify objects, and understand natural and human-made

**MUSICAL:**
Ability to distinguish and create pitch, melody, rhythm, and tone

**INTRAPERSONAL:**
Ability to construct an accurate self-perception and to use this knowledge in planning and directing one's life

**BODILY KINESTHETIC:**
Ability to manipulate objects and fine tune physical skills

**INTERPERSONAL:**
Ability to understand and interact effectively with others
CHAPTER III: METHODOLOGY

Survey

An initial sampling was conducted to determine learning styles, educational tool usage, habitual practices with studying, and the teacher/student dynamic. Participants of the Northeast Ohio region were polled through an online survey, represented an equal division of male and female, and ranged from freshman to graduate students of various disciplines. From an examination of the collected data, one can glean specific conclusions about Millennials and education. As a researcher, it would be necessary to identify student’s preferred tools in correlation with their education as to best produce an effective design solution. Future observations validated these findings.

Instructors were valued as the first individual a student would seek for further assistance and clarification of instruction. Peers and other sources, like a reference desk at the Library were rarely displayed as answers and valued least for supportive information. When investigating additional materials to broaden their understanding of a subject matter, the internet is selected with a 3:1 ratio over books. If it was necessary for a student to seek a peer for help, their modes of communication were arguably similar in numbers: phone calls, email, a verbal exchange in class, and social networks were all selected.

Student’s studying routines reveal their discretionary and favored choices. They seek studying alone, though sometimes will seek working with a group, but almost always in the home environment and on average a length of 30 hrs/week. The materials they use range from traditional to technological: writing implements like pens and pencils, the internet, and laptops were all rated high. Of these materials, notetaking was rated the best educational form of retaining information. Other materials used, but with less prominence, were cell phones, mobil music devices, tablets, and video. Some interesting shifts occurred in the data when the same options were given as tools to be used in the classroom. Cell phone usage doubled in the classroom as an item used. Tablets currently represented a 1:3 ratio to its older counterpart, the average paper notebook. When given the opportunity to rate materials in
the classroom, choosing what they’d like to see used with instruction, students chose laptops and tablets as the preferred source. The least interest was expressed over a flat screen TV to be used as a teaching instrument.

The habits of students have shifted from what was a mere 15 years ago. The internet was selected as the desired source for investigating subjects, a shift as the internet was not as popular or reliable over a decade ago. With this new tool comes issues though. The most popular social networks were also cited as the greatest distractions from effectively completing work. This would require further analysis to see if the solution could diffuse student’s desire to check social networks repeatedly, diverting their attention. The very nature of a digital platform that houses legitimate educational tools and social distractions presents an area to explore. Could a prototype provide the necessary tools to complete homework but diffuse their attention away from social networks while studying?

As students were given an opportunity to rate what motivates their work ethic, grades were selected as the most prominent choice. This selection showed a ratio of 2:1 over competency of a subject. Students were in a sense selecting an assigned value for their work over fully comprehending the subject they were studying. This statistic was alarming to unearth but another circumstance exists to factor this into a proposed design solution. Please refer to the Interviews section of the thesis where this topic will return but with uniquely different results.

Careful attention was paid to extract the styles in which students learn. They were given seven different selections for learning styles. Students rated spatial learning, the ability to learn through visuals as the highest chosen method. Following this method, in order of importance: Linguistic, logical, bodily kinesthetic, intrapersonal, interpersonal, and lastly musical.
Notetaking best for retaining info

30/hrs per week spent on studying

Studying happens at home most often

Studying done alone or a group

2/3 chose the internet as the supportive source for investigating supportive materials associated with studying

PROFESSORS are sourced most often for help, noted above graph.

50% of participants rated laptops as the preferred tool in a classroom

writing implements

notebooks

LAPTOPS &
textbooks*

*are used most often when studying and in the classroom

Preferred Learning styles

Visual

Tactical

Logical

Verbal
Observation

A variety of design classes were observed to record specific interactions between students and their professors, technology use in the classroom, and teaching methods. These observations were recorded over the course of one year’s time on foundational and upper division classes at Kent State University. Additional supportive information was provided by interviewing Professors at other Universities. By interviewing instructors outside Kent State, technology use could be compared from different environments.

The most prominent, universal aspect documented were distractions in the classroom. Validating input from survey feedback, students use social networking like Facebook and Twitter during class. Many times, these students were habitually checking their profiles repeatedly throughout class, sometimes minimizing the window, but always returning to reading posts by their friends. Using these modes of communication could prove to be distracting as students could miss key information conveyed through lectures or questions by the instructor.

Fig. 6. Technology Usage

<table>
<thead>
<tr>
<th></th>
<th>% of Items owned by students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laptops</td>
<td>93</td>
</tr>
<tr>
<td>Cell phones</td>
<td>85</td>
</tr>
<tr>
<td>Music device</td>
<td>81</td>
</tr>
<tr>
<td>Television</td>
<td>67</td>
</tr>
<tr>
<td>Tablet</td>
<td>33</td>
</tr>
<tr>
<td>Desktop</td>
<td>26</td>
</tr>
</tbody>
</table>

Fig. 7. Internet Distractions

- Internet supports studying most
- Facebook most popular network
- Internet, Facebook biggest distractions
Students had definitive expectations for the purpose of a class. Many times they had opinions of how a class should be taught and what they information they wished to retain from the course. Some would voice their opinions to the instructor, however some would quietly continue working but remain confused about the general direction of the class. Students wanted to have a clear path drawn, with specific guidelines outlined by the instructor. In VCD, the act of self-exploration and iterative process is taught, which is a large shift for incoming students to achieve. There is a marked divide between steered and guided by an instructor. As students would reach a point of frustration in their work they would request the instructor to state the precise changes would be required to achieve a good grade. This would result in students wanting a formula to follow as a means to achieve good academic standing. A multitude of outside factors contributed to students wishing to be directed by the instructor. Financial, familial, and peer issues were several pressures students cited as factors which influenced them.

The environment in which classes were conducted greatly effected the peer and instructor interaction. It was apparent in the first few class sessions of a course if there would be difficulty in the Professor connecting with the students. Restrictions which made it difficult for students to review a presentation lecture would beget disinterest with the instruction. Distractions from conversations in walkways adjacent to the classroom or viewed from a window contributed to further disturbances. Well lit classes with adequate room and educational tools like projectors equated to the strongest environments.

Professors would employ various teaching methods to best empower students with their lesson plan. A diverse set of methods achieved different results. The act of lecturing to the students, without their full engagement as with a conversation, or dialogue, left students with many questions. An active learning style in which students are participating with the instructor had stronger outcomes. Students would have less questions and left the class prepared to complete their homework.

Recent research on library environments shows adaptations to the ways in which they
are being accessed by Millenial students (Gardner, 2005). Libraries in turn have restructured their interiors to offer services best equipped to their patron base. Kent State’s campus library mirrors this aspect of catering to students needs and for this reason observation was conducted here. The goal was to record habitual practices with peer based learning outside the classroom. Rarely did an individual work solely, students were seated in groups working on the same subject. technology played a large role in the interaction. Cell phones, mp3 players, iPads, and laptops were not only used, but shared. Many times, a student would be sharing their work with a peer and turning the laptop to show them. If a student was working alone, headphones were used as a barrier against the quiet talking in the room. At certain times, cell phone conference calls were used to include peers from outside the area.

I had the opportunity to teach the same foundational design class three consecutive semesters while conducting this study. While reading literature on teaching methods I utilized assorted techniques as to evaluate their success. Metrics of success would include student engagement, retention and application of the instruction. The first semester I had the privilege of team teaching the course with fellow colleague and friend, Jason Richburg. Our combined interests were to achieve building a community in the class where students were engaged to work together. I would state as I do to my current class, “Why work through the trenches alone? Work together because by sharing the responsibility of learning you all grow.” The majority of students from that first class would continue to seek each other out in the future for support. The second semester was more difficult as Mr. Richburg and I were teaching our individual classes. An 8 a.m. time seemed to be a deterrent for invigorating class critique sessions. Additional literature was reviewed to inform my decisions in the classroom. Teaching methods dating back to the early part of the 20th century were considered, including intrinsic learning, creative based learning, flip teaching and student’s learning styles. In hopes of providing as many supportive tools necessary for a student to traverse through projects well.

A few new methods would be used in my final semester of teaching at Kent State.
An exercise was applied to the first class, encouraging group dynamics and the importance of iterations. The focus was to demonstrate the intrinsic value of working together, achieving more dynamic ideas through collaboration. By stimulating conversation between peers, the class became increasingly more vocal than previous course sections taught. Spruz.com was used as a feedback loop tool, introducing constant dialogue. Students uploaded photos of themselves and were encouraged to post iterations of their homework to receive additional instruction beyond the class sessions. This site was used as a tool to deliver instruction to the entire class. Craft demonstration videos were recorded and offered to students to use. The goal was to offer students repeated exposure to the same set of directions. As with craft they received an in class demonstration, course packet with written and illustrated instruction, and a video outlining the steps to achieve good craft. As opposed to previous attempts to build community based learning initiatives in class, the final semester seemingly came closest to the personal goal.

**Interviews**

Students of Visual Communication Design, Fashion Design and Merchandising were interviewed to gain a deeper understanding of their cognitive development and behaviors associated with education. Specific questions were extracted from the data provided in previous methods, which would inform choices for a prototyped solution. Many of the answers from these interviews were conclusive as overlaps did exist with student feedback. Categories of questioning fell under technology use, motivations, challenges, iterative processes, expectations, and community building initiatives with their peers.

Participants answered their greatest motivation came from peer interaction. As they attended class sessions and viewed stronger work, this drove them to seek strengthening their own design. This faired well for students in fashion design too. “Getting their [peers] input is a big motivation mainly because I get so focused in something. I get the feedback... it helps the working process”. Students saw the motivation as having opportunity as well. Many suggested a desire to work on group projects with students outside their discipline.
When prompted to imagine a group project involving contributions from business, fashion, and/or marketing, the scenario was received with great interest. “Different disciplines could be a more ‘real world’ experience, working outside our design community.” Though there were reservations about misaligned work ethics, many students welcomed the notion of a class framed around group projects reaching across the curriculum. Group projects could be structured as a ‘real world’ experience with a budget, time constraint, and defined roles hinged upon each student’s field of study. Interview participants remarked this experience would prepare them for future career collaborative work. The outcome of working as a team creates an environment where each student must evaluate input from another, assigning a value to the opinions. This in turn develops an inner dialogue, strengthening their ability to make successful choices in their work, and verbalize them with others.

Students shared a few expectations in respect to classroom experiences. Careful phrasing was used by myself to unearth hidden biases students have about their professors. The question posed was, “If you had a choice between a Professor or an industry professional to review your work, which would you choose?”. Students chose the industry professional 80% of the time. There are a few conclusions that can be made from this. The participants did not see the Professor as an industry professional and in some cases described their instructors as not having enough experience like someone who is working in the field everyday. “There is a bit of difference between the Professor and the industry professional. The professional is the trendsetter, the professor is teaching you about the trend. Professors many times are referring to past work or they do it as a hobby. Professors are not thinking about it as much as the individual in the industry, for them it’s their livelihood.” In addition, students weren’t conscious of Professors academic achievements. They were unaware of case studies, journal articles, conferences attended, freelance work performed, or projects of distinction. In a sense, they were uniformed with the relevancy of an instructor’s accomplishments. When Professors exhibited external projects and/or skills it was received with great admiration. “It was awesome to see a Professor draw and sketch, it was awesome.
Getting to talk about strengths and weaknesses, talking about their passion,” remarked a student on viewing their Professor demonstrate rapid prototyping. A lack of communication has cultivated a perception with students that Professors do not fully offer the level of expertise which could come from working with an industry professional. Millenials’ value in structural transparency presents an opportunity for Professors to demonstrate their work on external projects. This could reveal to students that indeed Professors are industry professionals. This perception by students could contribute to the ‘gap’ existing between the generations.

Based on the tech savvy characteristics of Millenials, it was surprising to here that when given the choice to use a computer, tablet, or writing implement with paper they chose the latter. Students identified hand manufacturing and prototyping as the preferred process to learn from and retain knowledge. This aspect of the interview session surprised me, however it was a delight to hear of them analyzing their cognition. If tablets utilized a tactile-like experience students may respond favorably to the interaction with the technology. Elements like margins and palette tools from InDesign, used quite frequently in the Visual Communication Design field, were regarded as “distracting.” Sketching and using cut paper to work out ideas permitted clarity in thinking. This naturally flowed into discussing the iterative process. “Trial and error informs my decisions. Originally I didn’t have a process. Writing about the process and reflecting on it allowed me to review my ideas.” Some Universities do require students to evaluate their work in written form, which does fabricate specific ideas about process. Curriculums could adopt the practice of requiring students to record their process as they developed a project. Many participants asked for process guides, or tools that they could try out, as a means to evaluate their effectiveness. The majority of design exploration performed by a student was expected, but providing them with more tools to guide them would be beneficial. “For design: this is problem, try and solve it, and take it to how complex the problem can be. Learn the majority by yourself is expected, but guidance would help. You need someone who shows you what you should be looking for. A
broad generalization, guidance”. “Is school challenging enough?” I asked. “Yes, it’s very very challenging, especially in VCD, if it wasn’t I wouldn't be doing it. If it was more, I’d probably die.”

Tablet technology does not appear to be making an impact with the interview participants. “I have a laptop, why would I want one?”, was a repeated sentiment. The participants did not see a reason to purchase the technology as school loans are limited. Students saw laptops as the only necessary educational technology item. Statistically, Apple reports IPads as exceeding desktop and laptop sales, as can be seen by the development paid to improving the device. New versions of the IPhone and IPad are introduced on average every year to great fanfare and record sales records. The newest iteration of the IPad, simply called the new IPad or IPad HD, is reportedly already sold out from preorders.

Community was a big portion of the conversations about education. Working together on assignments meant collectively the students would develop, contributing to each other’s work. One participant stated that without a peer community aspect he would have plainly “failed” the program. “We help each other even if we’re not in the same class. It brings inspiration. I love it. In this field you work with other individuals all the time. Having good intrapersonal skills in important. I can learn from other individuals.” Some professors do not contribute to building a community in their classes and it leaves the students leaving disjointed from the class. “I’ve seen individuals that don’t have the confidence to reach out and talk to other designers in the same program.” An opportunity exists in classes where instructors can nurture community as a catalyst for student development. If left to their own device, students can take up to 7 weeks or more to seek input from their peers, which can be half of a semester’s time frame.

Concluding the interview, scenarios were given to the students as to evaluate if they’d enjoy a tablet app with certain capabilities. The prototype scenarios included an interactive textbook that permitted a continuous feedback loop with fellow classmates and the instructor. Digital notebooks which allowed sharing of the notes, along with archiving
them, by semester, for future reference. Additional concepts were pitched and their ideas were recorded.

“I’d probably get rid of my Facebook for this. I WANT THIS NOW. This is a legitimate tool...it’s purposeful.” stated one student. She enjoyed hearing of the possibilities it had and its usefulness. Her only concern was that an online version was available as well. The other students responded with the precise same enthusiasm. By this point in the research, it was apparent that Millennials need for community and connectivity was paramount.

Instructors of visual communication design and fine art in the Northeast Ohio region were interviewed to best understand their thoughts on education, tablet technology, teaching methods, and community. The age of parties interviewed ranged from 30-63, male and female, all technology users of a various degree.

Instructors supported the idea of building community for students, however with varied involvement. Many of the instructors stated the importance of it, and recognized the impact it had, yet rarely did they take action to facilitate the exchange. “The innovation comes from the interaction of people” stated one instructor, certainly more in tune with Millennials need to connect. This same instructor was of the Baby Boomers generation, known for experiencing the ‘gap’ sensation between the generations. Based on observations and interviews, this research did not encounter a majority of individuals promoting peer connections.

Each University promotes a different method of teaching, and rewards certain achievements in academia. Some schools have a strong teaching component, where researching teaching methods in hopes of strengthening the classroom experience is valued. Other schools promote the external work produced by instructors of various title. Speaking at conferences, collaborating with local businesses on special projects, holding workshops, writing case studies and journal articles, etc. These are seen as necessary to build the curriculum vitae. Without the support of the school, promoting research on teaching methods isn't encouraged. This is definitely represented by the numerous comments by
Professors that “students just aren’t the same anymore, a shift has happened.” By connecting with teaching styles that align with the characteristics of the Millennials, the gap could be diminished or eliminated. As a visual communication designer and researcher it is beyond my field of study to make recommendations on teaching styles, though certain methods do seem more fitting. Please refer back to the Literature Review for information on this.

“My school purchases the newest technology, hands it over, and somehow I’m supposed to understand what to do with it. I don’t have the time between building lesson plans, meeting with students, attending faculty meetings, grading etc.” Faculty and staff of Universities are overextended without a foreseeable future of balance. With some of the instructors interviewed they conveyed a feeling of frustration over the expectations demanded of them. Without the proper training to explore the use of technologies in the classroom, and teaching methods connected to the newest generations, are schooling systems are failing students.

Special notation is necessary in examining one particular Professor. In his 60’s, this instructor never used email in his life. He felt computers were removing the ability for people to connect. In his department he remained an outspoken individual against technology. Just this past Fall 2011 semester he was asked if he’d like to attend a Faculty workshop, introducing iPad usage. Against his better judgement, he attended. As many faculty did not latch onto the iPad tablet, he quickly became enamoured with its capabilities. He enjoyed its user friendliness. “Email still sucks your life away, and I’ve become the worst offender. I wouldn’t have done that back in the day.” Using an analogy to describe his use with the tablet he remarked, “I have the crayola set.” One opportunity that exists with app development on tablets is the possibility to record the process of a work. “You can show people the whole process and save intermittently”. For instructors, rather than trying to understand the development of a student’s process through questioning and reading into their final piece it can be reviewed in its entirety. For Visual Communication Design, imagine seeing an animation of the work, leading toward the final piece. This holds great possibilities.
Technology is also growing exponentially, at a dizzying pace where staying up to date is nearly impossible. Demographers believe we will see generation gaps occur more often in the future. Within one generation, two to three great shifts could occur where there are significant differences between the populations. The instructor closed the last interview with just the right comment, “Learning happens all the time, if you aren’t here you’ve missed something.”

RESULTS

Hub Prototype

A few select opportunities have been reached in conclusion of this study. They have been developed into a tablet prototype which harnesses the capabilities of the device with a human-centered approach. The prototype itself factors in many of the aspects unearthed from the secondary and primary research. A comparative analysis was conducted to ensure originality of the concept piece. In addition, an app developer has been consulted with to confirm its functions.

Hub, (fig. 8) named aptly for being a singular housed unit of educational tools, provides students and faculty alike an abundance of unique functions. Hub is an educational continuum, eliminating the cognitive and physical barriers of learning and permitting the exchange of communication to occur as a feedback loop. The appearance is unique unto the user because Hub presents materials only necessary for the classes a user is active in, individualized for their education. The password encoded entry (fig. 9) ensures security for all parties included. New members enroll in Hub by signing up as a new user. In this first field, they are welcomed to create a profile including University name, major and minor, year rank, interests, courses enrolled in etc. The profile will structure the app based on the University where it is geo located. As an example, if I signed on as a Kent State student, it would recognize Kent is structured under two traditional semesters a year: Fall and Spring. Based on the calendar date, the app would ask, “Are you in your Spring semester of classes?” giving you the option to choose yes or no. Students at the University of Cincinnati, would reflect a
Hub arranged around quarters. This structure will dictate future tools of Hub, consistently referring to semesters/quarters as indicated by the user.

Logging in, the landing page (fig. 11) has many functions housed in a singular unit. To the upper left, the navigational tool remains prominent and color coded, easing maneuverability throughout the app. There are 4 navigational capabilities under Hub, each having a tier of functions. Those functions will be described in greater detail upon reviewing those sections.

To the upper right, our profile is visible with primary information. Under the upper blue region are four key navigational tabs which support further exploration. Each of these headline areas showcase the most recent activity of these sections. As an example, in the Notes section, three items are indicated which are the most recent notes recorded. These can act as quick link tools for re-connecting with most recent items. The main photo, of a smiling student, would circulate with recent articles posted by an Administrator. On this opening page, Professors’ external projects, exemplary school work, notable stories, and messages from the school Director can be illustrated. The stories can be scrolled through with a right to left finger movement, and selected by pressing the photo. Students had indicated during interviews they were unaware of Professors’ work, even disregarding their expertise when compared to an industry professional. This region would inform them with up to date background information in the relevance of their educator’s experience.

To the right of the main photo are a set of tools. These represent 4 connectivity functions located from the home page, read from left to right: Discussion Loop, Questions, Announcements, and High Priority. Figures 12 and 13 represent each of the links to these icons. In figure 12, questions are listed on the right of the screen. These can be general questions, or specific to the class. With each question posted, the user can select what individuals can see the post. The stream of questions can be accessed here. to the right of figure 12 is the Announcements section. Under this area of communication, users can share links to helpful materials and post invites to study together. Under both of these areas is
Education’s been taught a new lesson.
Fig. 9. Hub Sign In
Education’s been taught a new lesson.
the High Priority ticker. Streaming icons of questions roll by, referencing issues requiring immediate attention. For the student whom has a problem with their project due the next day, they can reach out to the instructor and peers to seek assistance. Of course, with using Hub, time management issues will be addressed in future figures.

Figure 13 demonstrates the Discussion Loop where users can post design or document pdfs for critique. Tools permit tagging the work with a precise nature. By placing the purpose of the tagging on the work and not the individual, it reinforces critiques as open discussions where the focus remains on the work. A highlighter tool encourages highlighting text to comment upon. The scrolling feature on the bottom displays all the posted work by date. After selecting the work, the individuals name, class, and project title is displayed.

Returning to figure 12, The most recent uploaded videos appear for quick reference on the right side portion of the design. These videos will be tutorials on the use of Hub, new features introduced on Hub following its debut, and videos posted by users. These videos can also demonstrate craft demos and announcements from the instructors or school officials.

At the bottom of the page is the quick reference for the Discussion Loop; posted work by students permitting a conversation as a means to develop iterations. The Loop is scrolled through to view the work, and by selecting a design the page will connect to fig 13 as discussed previously.

Choosing the blue icon from the navigational tool, the user is directed to the Calendar aspect of the app. The blue color is used as an indicator of selecting the Calendar portion. This can be seen by the large blue region on the right of the screen. In this area is the recent activity associated with the user’s calendar. Here, users can see scheduled meetings, project deadlines, and any other important time sensitive dates. By selecting ‘View All’ from this feature, the entire calendar of events can be sourced. Under the Activity section, posted questions and announcements, tagged for the calendar area are forwarded here. These same postings would be reflected on fig. 12, but without the filter of purpose. On the calendar page, only calendar posts show, as opposed to all posts. Assignments are shown on
Learning, synced.

Introducing Hub, where we make schooling easier. Customize your education through social networking and materials that develop with you. Grades, calendar events, assignments, videos, announcements, textbooks, and notes, all accessible right here. Take a tour and discover the difference.
the bottom portion of the page. These assignments can be inserted by the instructor, which would be forwarded to all enrolled students.

The Calendar window is also the first time we see a dock appear on the bottom of the screen. This function focuses the user’s attention on tools pertinent to education. Rather than exiting an app to enter another, functions are grouped together. The act of exiting and entering apps is exhausting and counterproductive to efficiency. Compartmentalizing thought processes into individualized functions, like apps have become, is turning into a hindrance rather than a help. As apps develop, it is my theory that they will begin to group together based upon user’s patterns of working with them. The apps will have a ‘universal smart’ function and pair up based on usability. As an example, if I always check the weather and maps consecutively, the apps could merge into one function.

The paper airplane icon on the bottom right of the dock is specific to Hub and displays an alert for all new postings from other users. It will alert for all questions, announcements, high priority postings, and discussion loop items.

Based on the survey section of this investigation, students regarded grades as the largest motivator in completing their work. This informed the decision to give grades its own section of the app’s navigation. Similar to the Calendar section (fig. 14), Grades is accessed by the red button of the navigational tool. The structure of the pages is consistent with the Calendar page and will remain so for the other navigational destinations. On the main page of Grades (fig. 15), the right portion remains the recent activity indicator, yet this time showcases recent grades posted for the user. The Grade portion illustrates grades by semester first, then by class. Using the scrolling feature for each semester, all the classes can be accessed. By pressing the plus symbol, it will only present a window with grades from the coordinating semester indicated. On the bottom portion of the Grades page, transcripts are generated for each semester a student is enrolled in a University. Professors can access the transcript section by semester, to review archived grades of past classes taught. This permits reflexive consideration by the instructor of student achievement.
Fig. 12. Hub Q&A, High Priority

**Questions**

Jason Goupil
Intro to Typography
Yes, Maxwell, you’re right. Some things do change. Keep in mind the size of the type and remember it’s in RGB, not CMYK. You may want to do a little research into typography and coding too.

Maxwell Miranda
Intro to Typography
Does anyone have information for designing with type on the web? I know the rules can be different and I’m not sure which ones to adhere to. I know the size of type can greatly be affected, but are there other things?

Chelsea Tobin
Intro to Typography
I’m working on the type exploration exercise and need some help. I’ve posted my work on the loop if someone could help me out. Do you think I’ve achieved completing different compositions? Or do they feel too similar?

**Announcements**

JJ Fecik
VCD Studio
I started working on Project 4 and ran into trouble with developing a strong layout. As I kept working nothing seemed to reach a solid look. I abandoned the computer and returned to sketching which was a huge help. Don’t forget, drawing is a great prototype tool too!

Maxwell Miranda
Intro to Typography
Great ideas for inspiration!

Chelsea Tobin
Intro to Typography
I was working on my craft last night and things went horribly wrong. The adhesive kept bubbling up. Can someone meet up with me today and explain what I’m doing wrong?
Pressing the green tab for Textbooks from the navigational tool, the user is sent to the initial window for this section. Reviewing fig. 16, the structure of the page has remained consistent to other navigational destinations. The quick reference tool on the right displays recent texts read. By pressing the book title, the user is redirected to the exact portion of the text where they had left off.

Users can access texts, both required and recommended readings, by semester and course. The plus symbol allows to view all the books associated with each particular semester. The texts displayed here would be imported from the purchases made through iTunesU. Based on the profile information provided from the user, Hub would identify the book as belonging to a certain course and copy the purchase to the Hub framework. The intelligence of Hub is initially provided by each University, and can be updated at anytime.

Selecting a text to navigate, the user is directed to a scrolling feature, (fig. 17). The book is displayed to the right, with the tile, author, course title, and a required or recommended status. Under this information, users can search the book by keywords. If the user remembers reading a particular area but can't recall the exact location it can be sourced this way. As with many digital platforms, having the ability to access items from multiple choices provides different ease of use. Selecting portions of the textbook can also come from the scrolling feature, with each chapter indicated by the large page divider. In the textbook overview section on the right, the quick reference tool permits users to access a book by the intro, chapters, specific pages, and dog-eared items. This last function will be described in detail later.

Still under the navigational section, users can press the page number and a magnification of the page appears (fig. 18). This is intuitive to leafing through a textbook and scanning the paragraphs. When the user removes their finger from the number the magnification is removed from view. Current versions of reviewing digital textbooks do not have this function, yet it is a normal process of an individual searching for the correct portion of a book.
Fig. 13. Hub Discussion Loop
Fig. 14. Hub Calendar
Fig. 15. Hub Grades
Selecting the introduction of the book, the user is redirected to a text which permits reading. This image (fig. 19) appears to be similar with other versions of digital books yet provides more tools, again basing them off of intuition. The tools tab is hidden from the text at the bottom of the screen. By sliding the tab away from the user they can access a multitude of tools.

Figure 20 refers to dog-earing a page of importance. Other versions of tablets utilize a new framework for selecting a page of noted importance. Comparative analyses present other visuals which are not a common part of a user’s vernacular. Apple’s iPad uses a small ribbon hung over the upper right of the page. Referring back to the interviews with Professors, they commented on not receiving the necessary support to learn the use of new technologies. It was important in the structuring of this prototype mimic common behaviors associated with textbooks, as the dog-eared page is. Future iterations of Hub can move further from digital representations of our interactions with a physical book.

The features of Textbooks expand our common usage of a digital tablet of text. The question became while developing this prototype, why limit learning to a solitary experience? Instructors have identified the importance of connectivity with people. Key interviews with instructors have shown community learning leads to innovation, and it’s not a singular experience. Interaction invokes inspiration, inducing innovation. Figure 21 introduces the interactivity of a textbook. By selecting the highlighter from the lower tools tab area, finger swipes highlight the text of noted importance. Following this motion, an icon appears to the left of the text. By pressing this icon, the user is directed to seek additional support associated with their comprehension of the subject. The highlighted text appears as an extracted fragment with options to ask a question to a variety of audiences (fig. 22). The course Instructor, friends (which have been selected in your settings from the landing page), or the entire class can be sourced for help. This function is referred to as a learning continuum connect. The user selects the audience highlighted text will forward along with their question. This will appear on other users question board. As highlighted portions become
Fig. 16. Hub Textbooks
Fig. 17. Hub Textbook, Navigation
uniquely associated with the owner of the text, individualizing their learning experience. The continuum conversations will be saved as an extension of the text for each user.

Selecting the last portion of our navigational tool, the user is directed to the Notes section, indicated in yellow. The main pages of Notes presents a similar structure to the Textbook, Grades, and Calendar pages. To the right, under the yellow color panel, the most recent notes recorded are accessible as a quick reference tool. The notes are categorized by semester and class with a scroll feature to view each one. As the semesters continue, notes are archived by semester and year under the lower portion of the page. The notebooks are completely individualized to the user and they can design them for their needs. Referring to figure 24, the user is directed to the design portion of Notes. The user has options to design the look of the notebook. In the comparative analysis, other digital versions of notetaking do not have the capacity of designing the notebook. Using a simple method of hierarchy, it is easier for the user to connect with the look of their notebook, than to read the course title underneath. The course is only considered supportive secondary information.

Following the palette of choices from fig. 24, on the right portion of the design, users have 8 choices associated with design. Binding, cover styles, patterns, stickers, labels, photo(s), paper, and subject sections create the ultimate student tool. The subject sections can be touched for quick reference, and pages can be deleted or added with various paper styles.

Fig 25, the notebook has been selected for the course VCD Studio, as is shown stamped on the upper portion of the page. Time stamping all pages can be selected from the settings portion of the lower tools tab. Opening the tab, the user has many tools. Reading from left to right: cut and paste, settings, pen options, delete page, email page, dog-ear, photo, print, and reminders. The print function introduces monetizing the app by users ordering the text to be printed as it was designed in the app. All the individualized choices would be repeated in the printed piece. (fig. 26) Demonstrates the dog-ear function, showing consistency between textbooks and notebooks in their usability. By pressing the
Fig. 18. Hub Textbook, Quick Reference Scroll
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Change by Design

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Has anyone else read anything about design thinking? Are there books you’d recommend?

— Shawn

I’ve found a few things while searching online. I’ll email you some links tonight.

— Chelsea

Thanks Chelsea, these are great!

— Shawn
Fig. 23. Hub Notes
Fig. 24. Hub Notes, Design
Fig. 25. Hub Notes, Individual Notebook with Tools Tab
reminders icon (fig. 27), users can post an inspirational quote, or other reminders that aren’t as important to schedule within the calendar. By pressing the plus symbol the reminder is posted to the board (fig. 28). Using both fingers, the notes can be enlarged to accommodate more text. The share note feature (fig. 29) allows the user to search for a classmates name and motion to flick the note to a friend. Shared notes would appear with greater importance than an emailed note and will appear on the receiver’s screen. If a receiver wishes to control the notes settings they can do so from the tools tab. Emailing a note and deleting a note (fig. 30 and 31) is similar to sharing a note with a kinesthetic quality.
Fig. 26. Hub Notes, Dog-eared
Fig. 27. Hub Notes, Reminders
Fig. 28. Hub Notes, Posted Reminders
Fig. 29. Hub Notes, Share a Note
Fig. 30. Hub Notes, Email a Note
Fig. 31. Hub Notes, Toss a Note
Further research on teaching styles is necessary to unearth methods that harness the tech-savvy students which exist today. As technology develops, and our access to information changes, we as educators must meet the needs of the students and prepare them for our fast-paced economy. Active, student-centric, and flip learning were three methods researched for this work, yet additional ones could exist.

Cognitive and physical barriers do exist with current technologies. The compartmentalizing of intelligences used in apps on mobile devices creates these barriers. While developing Hub, the idea of intelligent convergent apps was created. Apps would learn from the user’s interaction and patterns to converge modes of thinking together. As an example, if I always check my email and text messages consecutively, and they are both considered modes of communication to where their merging makes sense, is it possible to converge them into one? This is theoretical in nature and additional research would be necessary to determine if it’s possible.

Continue investigating ways in which we as designers and educators can formulate tools to best teach our youth. As stated by John Glenn, the success of our nation is determined by the level to which we engage our students. It has been observed that many times, educators deliver materials to students and tell them to ‘get inspired’. Though this is a genuine thought by the educator it places emphasis on the materials, not the interaction. It is in the classroom where ideas are exchanged, development occurs, and inspiration transpires.


Good Education (2011, December) This New App Turns Your iPad Into Your Classroom. Retrieved from: http://www.good.is/post/this-new-app-turns-your-computer-into-a-classroom/?utm_source=pulsenews&utm_medium=referral&utm_campaign=Feed%3A+good%2Flbvp+%28GOOD+Main+RSS+Feed%29

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http://bostonglobe.com/business/2012/03/13/demand-for-ipad-rivals-leads-idc-raise-forecast/1v9AjRxDym4x3d6Jc13ZhJ/story.html


