Our mission: empower citizens of the Web by sharing the most important skill of our era — the ability to read, write, and participate in the digital world.

This document highlights findings from a two-week ethnographic research project in Chicago, conducted between April 12 and April 28, 2015. This project stems from the desire to co-design our products and programs with our users, and to grant our work an international scope.

During our previous six months of ethnographic research, we focused chiefly on emerging countries and conducted studies in India, Bangladesh, Kenya, and Brazil. With this project in Chicago, we intended to analyze the similarities and differences between our audience in emerging markets and our audience in North America.

Questions?
We encourage you to reach out with suggestions and questions about this project.

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“I came for the show, I stayed for the fandom.”
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Approach

Research Objectives

Learning Products
We aimed to study what influences users’ behavior when consuming, creating, sharing, and remixing content online. These findings would help us to empower users through Webmaker. Since our main user segment ranges from 14 to 25 years old, we interacted with, observed, and interviewed a large number of teenagers.

Learning Programs
We aimed to understand the motivations and constraints of those teaching the Web today — both in formal and less formal educational settings — in order to improve our offerings to educators and activists.

For both initiatives, we studied how participants learn best with or without technology, the skills that are important to them, and the characteristics of their ideal learning environments.

Research methods

ETHNOGRAPHY
We used various ethnographic methods (Appendix 2) in order to understand the contours of Chicago’s culture and analyze the different trends, mindsets, and behaviors surrounding Internet and mobile usage in Chicago.

INNOVATION BY USERS
We aimed to meet a diverse set of participants to better understand our lead users, those who might use our product in the future. We also sought to discover who will not use Webmaker and why. From these interactions, we gleaned participants’ true stories, called portraits, to better understand our audience.

ITERATIVE DESIGN
We used our Webmaker prototypes as a research tool to better understand participants, and to involve users in the center of our design.

Limits

Despite our efforts and those of our partners to reach a diverse and representative sample of the population, we are aware of the limits of this research. We acknowledge that the data collected reflects only a part of Chicago’s population, hence only one slice of the United States’ population.

We are grateful for help from our colleagues and partners at Hive Chicago and recognize that conducting this research alongside them may have increased the number of participants from lower income communities.

A complete list of our participant scope and research methods can be found in the appendix section. Extrapolating from these results should be done with caution.

1. Hive Chicago is part of Mozilla’s Hive Learning Network, a connected community comprised of 64 local member organizations working together to foster connected learning experiences for youth in Chicago. Read more at hivechicago.org.
Chicago’s Urban Landscape

Chicago is often recognized as one of the most segregated cities in the United States, but also as one of the richest in diversity³. This phenomenon is illustrated on the map created by Bill Rankin, “A Taxonomy of Transitions”, where we see a clear delimitation of the area by ethnicity⁴.

Rankin’s map, “Flavors of Blur”, displays income repartition per household.

As we conducted research in some of these communities, we observed different digital literacy levels among participants.

Without drawing any hasty conclusions, we can note that participants’ cultural and family environments influence their confidence and behaviors with regard to Internet consumption and creation.

We expand on our analysis in the following section: THE WEB JOURNEY.

Chicago is the third most populous city in the USA, with over 2.7 million inhabitants².

Our Research Map
This map shows the location of our 69 research participants. When paired with other maps, it helps us understand our research population.
These two maps were created by Bill Rankin, historian and cartographer.

www.radicalcartography.net
**The Web Journey as a framework**

Our first iteration of the Web Journey came about in November 2014, when we started to analyze the different ways people engage with the Web in Kenya.

As our research projects continue, this framework is constantly evolving and expanding. Our research team identified common patterns in India, Bangladesh, Kenya, and Brazil, and we discovered four key stages of engagement with the Web. From “No Use” to “Creation,” each stage has its own set of motivations and constraints.

We use the Web Journey as a reference framework in our research approach, trying to understand where each research participant would place. For this specific Chicago project, we aimed to study if the Web Journey was different for users in emerging/mobile-first markets and developed markets. We also aimed to map the different skills participants aspire to master as they move along this journey and engage more deeply with the Web. This allows us to understand where and how the Mozilla Foundation can act.

We divide the Web Journey into four stages:

- **no use** People who do not use the Web, either because they are unaware of its existence or because they choose not to. Those who choose not to use the Web are either rejecting it or have a perceived inability to use it.

- **limited use** People who limit their understanding and use of the Web to a very small number of platforms (usually social media like Facebook, WhatsApp, YouTube, etc.) or to a limited variety of content (gossip, entertainment, etc.).

- **leverage** People who are able to seize the opportunities afforded by the Web in order to improve their quality of life (to learn, to find jobs, to grow their business, etc.).

- **creation** From the tinkerer to the web developer, creators understand how to build the Web and make it their own.
no use

Access + Need/desire + Ability

→

limited use

Understanding what’s possible + Ability to navigate and control + Ability to critically assess content

→

leverage

Desire to use authoring tools + Ability to use existing platforms + Inspiration and confidence

→

creation

“I only use Facebook and Instagram.”
- Teenager

“When other people are using the Internet and I am not able to, I feel ignorant.”
- Parent

“The Internet is more than a six-second Vine video.”
- Informal educator

“I’m currently learning Python and other stuff so I can create my own software.”
- Teenager
Skills

These interviews often uncovered skills that were not exclusive to the Web but that participants viewed as crucial to becoming empowered Web citizens.

During our interviews we asked people to discuss the skills they would like to master on the Web, the skills they consider mandatory when one starts using the Web, and the skills they would like to develop when using the Web.

We combined the resulting skills list (Appendix 1) with our observations and organized the skills by the four stages of the Web Journey. These skills enable a more comprehensive understanding of this framework — they operate as bridges and allow users to move along the journey.

**no use**
- Hardware basics (understanding a device)
- Internet basics (Browsers, pages, connectivity, apps, logins)
- Vocabulary

**limited use**
- Navigating the Web
- Managing online information
- Privacy and safety basics
- Online identity management
- Web culture and etiquette
- Legal and licensing basics
- Critical thinking

**leverage**
- Coding
- Composing on the Web
- Remixing
- Design and accessibility
- Infrastructure

**Blockers**

Based on our observations and interviews, we determined the different obstacles related to each stage of the Web Journey. These findings enable us to understand the various elements that block progression.

**limited use**
- Access to devices and infrastructures
- Security and environment
- Lack of relevant use cases
- Perceived inability / lack of skills

**leverage**
- Smartphones are the point of entry
- Computers are associated with work
- Socio-economic environment and mindsets
- Limited informal learning opportunities
- The Web is in English

**creation**
- Smartphones offer a limited creative experience
- Reliable connectivity
- Lack of tailored opportunities for youth
- Finding a mentor can be difficult
- Lack of material resources
- Opportunity cost
- Personal confidence and creative fear
In this section, we detail the four stages of the Web Journey as they relate to Chicago’s research participants.

For each stage, we outline:

- **Common behaviors**
- **Constraints and blockers for moving into the next stage**
- **Skills necessary for progressing to the next stage**
- **User stories and personal motivations**
- **Mechanisms and points of access**
Behavior

In Chicago, we did not meet any research participants who were unaware of the Web’s existence. However, we did encounter participants who do not use the Web. They are usually aware that something called “the Internet” exists, but have a very limited understanding of it.

We encountered two types of participants who are aware of the existence of the Web, but do not use it. They fall into either one of two categories:

- **No desire to use**: they do not believe the Internet is relevant to them, and choose not to use it due to rejection or perceived inability.

- **Unable to use**: they do not have access to devices or networks.

This phenomenon was also observed in the older generation. Parents and grandparents may not see a use for the Web, and lack confidence when using new technology.

“We tend not to use online resources because of the lack of access. There is a big discrepancy for these kids.”
– Informal Educator, art program for teenagers

We encountered this type of person in Chicago’s low income communities, where access to reliable technology and infrastructure is an issue. This is especially true for the unemployed and homeless populations, who might be aware of the Internet and hope to use it to improve their lives.

“Most of them think a computer is the same as the Internet, and they don’t get the difference.”
– Digital Trainer, Chicago Public Library
We asked participants to describe what “being from a low income community” means in Chicago.

Combined with our other observations and interviews, we can state that families in Chicago’s low income communities are likely to: have their children in the Chicago Public School System, receive food stamps from the government, experience long commute times and transportation-related issues; have a government pre-paid phone and live in areas where security is a problem. Families’ access to technology is often unreliable and exclusively through mobile devices.

A person who is low income is someone who works in a factory; they earn minimum wage. They work early mornings and late nights. Long shifts and no time [off].

Some people might have side businesses, in the sense that they would sell flowers in the streets for Valentine’s Day, or they would sell food in the streets. This area has the highest commerce rate in terms of buying and selling. [...] They have federal aid like food stamps, insurance help. A lot of people do informal child care out of their home. They earn less than $9,000 a year. They stick with their kids, and then it’s a household of their kids and their kids’ kids. For a low income family, it’s not rare that they would have five kids, or six kids. [...] They have a phone for sure. It’s a smartphone but they have pre-paid data. But they have no WiFi at home. Of course they have television. Basic TV just plugged in, no extra channels. They might have a computer, it would not be a surprise. But it would always be for the kids, for homework.”

The problem is that after school, the children don’t have anything to do. The parents cannot pick them up because they work late. So the kids stay in groups and they do bad things. Here a lot of children die.

5. For the USA federal definition of poverty, see http://aspe.hhs.gov/2015-poverty-guidelines

From a conversation with a member of the Hispanic community.
Obstacles to begin using the Web

ACCESS TO DEVICES AND INFRASTRUCTURE REMAINS AN ISSUE

Despite various efforts and programs to increase access to technology and the Internet, Chicago remains a city where some are unable to access the Web reliably and regularly.

“Living in the world as it is everyday, they just do not have the access to the Internet. I just can’t get past the access point to be thinking of what is next.”
— Community Program Director

“I don’t think I have ever seen anyone with a smartphone here.”
— Digital Trainer, Chicago Public Library

Many people say Internet access is no longer a problem, citing a growing number of smartphones, tablets and other devices, plus the availability of free public Wi-Fi. But this belief is disconnected from reality. For example: while one program allows low-income communities to connect for a modest cost, the product is unreliable and low quality — leading to little usage, or none at all.

“We tend not to use online resources because of the lack of access. There is a big discrepancy for these kids.”
— Informal Educator and Artist

Furthermore, research in Chicago has shown that smartphones are not bridging the digital divide in less connected communities (Karen Mossberger, Caroline J. Tolbert, Allison Hamilton, 2012). This access inequality is visible when walking in Chicago, where a simple change of neighborhood can lead to a loss of connectivity.

“The phone signal is really low here. It’s a five-minute drive (from our previous location) but the change was pretty drastic.”
— Informal Educator and Artist

SECURITY IS A MAJOR CONSTRAINT

Some areas of Chicago experience a great deal of community violence, and gang fights and general security regularly affect inhabitants. This contrasts starkly with the very wealthy, safe parts of the city.

“My biggest fear has always been that I would lose a child to the violence of the community. It’s still my fear today.”
— Parent

Parents are reluctant to let their children travel alone. Therefore, visiting a public library or afterschool program requires a parent to drive. In families where both parents work, sometimes multiple jobs, this security and transportation issue impacts what activities youth are able to attend.

“Gang borders prevent some youth from coming — you are recognized when you are not in your territory.”
— Informal Educator and Artist

“A lot of children die here.”
— Parent
They learned tech skills with the phones, and now they are trapped. A PC is just strange to them.

— Digital Educator, Chicago Public Library

LACK OF RELEVANT USE CASES
One reason some individuals don’t use the Internet is an ignorance of what’s possible and dearth of relevant use cases. For the older generation in particular, the Web can appear relevant only to youth who like to “exchange pictures and chat with each other.”

PERCEIVED INABILITY TO USE THE WEB / LACK OF SKILLS
We also observed a strong lack of confidence and a perceived inability to master both devices and the Web.

But just because an individual is not online does not mean he or she is not interested in using the Web. Instead, he or she may feel so overwhelmed that they do not even try. This leads to ignorance and despair, with the user feeling left out.

“They received help from their children, but without really understanding. So they have an email address but cannot access it, for example.”

— Digital Educator, Chicago Public Library

Research participants not yet using the Web expressed a desire to learn:

For utility and aspiration, and to keep up with society. For example, one participant needed a friend to complete mandatory online government paperwork. The participant had never used the Web, and felt incapable of doing so.

For entertainment. For example, one participant wanted to learn how to use YouTube, in order to watch videos of the Pope.

“When other people are using the Internet and I am not able to, I feel ignorant.” — Parent

“I don’t touch the computer because I’m afraid I will mess it up.” — Parent
BASIC LITERACY
Among the poorest and most challenged communities in Chicago, basic literacy remains an issue. Individuals struggling with basic literacy include those without an education, non-native English speakers, and/or the unemployed or laborers.

“Many people come to us and they don’t have basic literacy. You know... I’m talking about the normal literacy, not even digital.”
— Digital Educator, Chicago Public Library.

HARDWARE BASICS
In order for people to come online, they need a basic familiarity with devices: how to turn them on and off, what they’re capable of, and so forth. For some, learning begins with these simple mental models. Without these models in place, navigating the Web can appear too difficult.

“To explain what an email is, I have to take a paper and show them that it cannot get into the computer.”
— Digital Educator, Chicago Public Library.

ENGLISH LANGUAGE
Some participants believed an ability to speak and read the English language is necessary to access the Web. This came mostly from non-English-speaking communities.

“I cannot use it because I don’t speak English.”
— Parent

INTERNET BASICS
In order to get online, basic knowledge about the Internet is required. For example, the ability to identify a browser and a search engine, or to connect a device to Internet. Users must have a simple grasp of Internet vocabulary.

“I can detect in two minutes how the training will go by the way they touch the mouse.”
— Digital Educator, Chicago Public Library.

no use
Skills needed to begin using the Web
no use

User stories and motivations

When research participants discussed what motivated them to first come online, this is what they shared.

**FOLLOWING THEIR CHILDREN**

“I am learning the Internet because I want to know what my children are doing.”

– Parent

Parents may come online for the first time to monitor their children and keep up with their lives. In these scenarios, the child acts as the point of entry online and shapes the parent’s behaviors. Parents are motivated by the appeal of social media and by general curiosity — but also by a fear of the possible dangers their children face online.

**RESPONDING TO PEER PRESSURE**

“We came here to learn how to use Facebook and the Internet” – Parent

Many adults come online to join Facebook. This stems from a personal desire to keep up with what is trending, but also from peer pressure.

For example, some community activists said they wanted to learn how to use Facebook and the Internet in order to mobilize the community and to share information. Without Facebook, they said, it seemed difficult to reach the community.

“We came to learn about Facebook and other tools. We need to know these networks for our community events and activities.”

– Parent

“I felt ignorant, and so I bought a smartphone, even if I did not know how to use it.”

– Parent

**PROFESSIONAL NEED**

Many adults take classes to learn computer and Internet basics in order to find a job, change jobs, or develop skills.

“They go from 10 years of a manual job without ever connecting to the Web and, suddenly, they wake up in a world where they need an email address to exist.”

– Digital Educator, Chicago Public Library

**ACCESSING GOVERNMENT DOCUMENTS OR INFORMATION**

Many government documents (social security, immigration, retirement, etc.) are now exclusively available online, which places many people in an uncomfortable situation.

“Isn’t it ironic that the papers you need to retire are only accessible online today? I had to do it for my mother because she has never been online and would not be able to find them herself.” – Young Adult

Adults must navigate websites to find the necessary information. One informal educator and community activist noted that the immigrant population often experiences difficulties downloading files, even though it’s a necessary skill for their daily lives.

Therefore, these users frequently ask for help and sign up for classes to learn the Web and other digital skills.

**ACCESS TO THE SCHOOL WEBSITE**

As with government documents, parents are frequently forced to use the Internet to view their children’s grades and other school information. This often acts as a first point of entry online.

“I must learn about the Internet because it is the only way I can see my child’s grades.” – Parent
Within the "no use" category, we identified specific points of access:

**PUBLIC LIBRARIES**
Libraries are a place people feel they can go for help with technology and access to free WiFi and devices. In Chicago, the Cyber Navigators and staff from the Chicago Public Library play an important role in bringing people online, acting as guides to the digital world.

**CHILDREN AND YOUTH**
Adults will often rely on their children or youth from the community to teach them the Web; youth are a major point of access for those not yet online. Children are seen as savvy and capable teachers when it comes to new technologies.

**COMMUNITY PROGRAMS:**
Chicago has several community programs that provide free learning opportunities to adults, especially immigrant populations. These programs focus on community activism, Microsoft Office suite, Facebook, and more.

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8. 48 Cyber Navigators are working as digital trainers in various branches of the Chicago Public Library. They teach computers and the internet to people who visit the library seeking access and help.
limited use

Behavior

Limited users are individuals who use the Web in a partial manner. They may use only a handful of platforms, or consume small amounts of content.

These users have little understanding and mastery of the Web, and we observed that their behaviors and mindsets are heavily influenced by the few platforms they use.

Generally, these individuals are also influenced by what people around them are using. Behaviors may include using social media to share photos and status updates, downloading and streaming content like music, games, and video, or accessing news, entertainment and sports websites.

“They ask so many questions they could find online. How is this even possible? There is so much accessibility, but in their head the Internet is Instagram.”

— Informal educator

“They skills vary – but they are in this bubble and they need to break out of that. They have so much difficulty expanding their knowledge.”

— Informal educator
THE SNAPCHAT LOVE STORY

“If Snapchat was a phone I would totally buy it. The only thing missing today is call.”
– Teenager

Snapchat is a mobile application that allows users to send each other ephemeral pictures and videos with captions.

Some teenagers are so drawn to Snapchat that they use it for multiple purposes, like:

- exchanging media with friends,
- chatting with friends,
- learning about a subject that interests them,
- and keeping up with international news.

Snapchat might rise and fall like Facebook, Myspace, and other tools, but analyzing it allows us to understand youths’ motivations and interests, as well as their digital literacy and skill levels.

A SPACE OUT OF PARENTS’ REACH

“I check my son’s phone everyday, if there is any log deleted, any conversation, I take the phone.”
– Parent

Teenagers are constantly seeking privacy, whether by codifying interactions on networks where they are “friends” with their parents or by using services where parents cannot find them (boyd, 2014). This might have played a role in the fall of Facebook in some countries, to the benefit of Instagram and Snapchat. With Snapchat, this competitive advantage is even stronger, since ephemeral content generally means no parent can view what their children are sharing.

The ephemeral aspect of Snapchat also leads to:

- More fun for users, who can send anything as opposed to carefully choosing the picture they share,
- More privacy and secrets, promoting exchanges of all kinds,
- Less fear of strangers and stalkers,
- Less pressure about their image and behavior,
- A much higher frequency of creating and sharing content.
THE PUSH PARADIGM

“I like to learn on Snapchat, they push stuff that you would not find yourself. For example, I was like, ‘guys have you seen the recent update on St. Patrick’s Day?’”

– Teenager

In addition to the ephemeral aspect, Snapchat also revolves around a “push” concept, where the user can only send content. It is only possible to engage in text chat with someone after first sending them media.

This concept allows users to live within the application without pressure from strangers, parents, or even peers and friends. It also emphasizes content creation and sharing above all other capabilities.

“I film myself on Snapchat in English class, but there is nothing interesting.”

– Teenager

“I use the discover feature on Snapchat. I like the Daily Mail and the music. I use Cosmo in the morning, too.”

– Teenager

WHEN CONTENT CREATION BECOMES A CONVERSATION

“I see my daughter on Snapchat every second, filming or capturing normal things like when we prepare dinner.”

– Parent

Snapchat has lowered the bar for content creation. Users regularly send photos, videos, and drawings made on the fly, and at any time of day. Users document every day of their life on the platform, sharing moments both trivial and important. It is a new form of ephemeral and on-going conversation, allowing youth to maintain constant connection with their friends.

“I film myself on Snapchat in English class, but there is nothing interesting.”

– Teenager

“I like Snapchat because you don’t have to answer to everyone, you just send things. Look, I did not reply to her, and it’s perfectly okay.”

– Teenager
FACEBOOK, THE BORING NETWORK

As we noted previously, despite its billion users, Facebook holds an insignificant place in the hearts of Chicago’s youth. The arrival of parents and adults on the social network likely contributed to its decline. Facebook is considered the most boring network by young people and the most harmful by parents.

When speaking with parents, we often heard them complain about young people’s behavior on Facebook: oversharing, public disputes, inappropriate comments, neglecting real life. Parents’ criticism pushes youth off of Facebook and on to different platforms to escape parental pressure.

“I got into trouble for posting inappropriate things on Facebook.” – Teenager

“My mother did not allow me to put this photo on Facebook because I had my belly out, so I put on Instagram.” – Teenager

While we did observe this pattern among a large number of youth, it should be noted that Facebook is still used by many, especially youth from lower income communities.

“I use nothing other than Facebook and Snapchat.” – Teenager

Facebook still shapes online behaviors and understanding of the Web, especially among the youngest users and those with limited access to learning opportunities. As in Bangladesh, we met teenagers in Chicago who do not see a difference between a web page and a Facebook page.

*Excerpt from a conversation with a teenager*

TEENAGER: I am confident that I can create something online.

RESEARCHER: Great, how would you create a web page or a blog, for example?

I would go on Facebook and click on Page. Then I have a web page. I don’t know what a blog is.

Ok, cool. What if you wanted to create a web page outside of Facebook?

Like what?

What other websites have you used aside from Facebook?

Instagram.
For younger teenagers, Facebook is also seen as a way to become Internet Famous. Youth seek endorsement and large followings, adding anyone as their friends in order to grow their fan base.

“I gave my password to him because he said he would make me Facebook Famous.”
– Teenager

“Yes, I would love to be Facebook Famous and have more followers, more friends, more likes.”
– Teenager

In terms of content consumption trends, we uncovered an affinity for video — especially short videos like those produced on Vine, Instagram, or Vlogs (video blogs produced by YouTubers).

YouTube is one of teens’ preferred platforms. Teenagers will spend much of their free time watching content from YouTubers they follow religiously. Teens subscribe to multiple channels and admire these Internet celebrities. Teens are attracted to the online communities and fandoms that develop around YouTube shows.

“We should totally start a YouTube channel together, we would be so famous.”
– Teenager

“I’m on YouTube a lot because of Bronie Fandom. We mix fan animations, videos, artwork, fan games. I came for the show, I stayed for the fandom.”
– Teenager

This impacts the way users think about social features within a product. For example, many teenagers have been asking us to implement a view counter on Webmaker projects, similar to the YouTube feature.

“Most of my life is YouTube”
– Teenager

“We should totally start a YouTube channel together, we would be so famous.”
– Teenager

“I’m on YouTube a lot because of Bronie Fandom. We mix fan animations, videos, artwork, fan games. I came for the show, I stayed for the fandom.”
– Teenager

This impacts the way users think about social features within a product. For example, many teenagers have been asking us to implement a view counter on Webmaker projects, similar to the YouTube feature.
limited use
Blockers when moving to leverage

For both the younger and older generations, limited use behavior is linked to several factors, many of which are interconnected. Here are some of our relevant observations.

SMARTPHONES ARE A POINT OF ENTRY TO THE WEB, AND A REASON FOR LIMITED USE

Most young people today discover the Internet through a smartphone. According to data from Pew Research Center, 91% of teens in the U.S. use the Internet on a mobile device, with little to no variation among income levels.

This phenomenon is increasingly important in lower income communities, where access to the Web is often limited in terms of devices and infrastructures. In discovering the Internet through smartphones, young users browse within mobile applications and are less likely to discover the open Web. Research also shows that those who only access the Internet through a mobile device are less likely to engage in digital citizenship activities. This can be linked to the device, like the size of its screen, default and featured apps, the OS, and touch-screen capabilities.

For the adult generation, we observed analogous behaviors and mindsets in lower income communities for the same reasons mentioned above.

These adults might have grown up doing manual labor and with no need to use the Internet in their professional and personal lives. As they come online, they discover the Web through smartphones and mobile applications, much like their children.

We did not encounter this behavior in higher income communities, where adults are more likely to use the Internet daily in their professional and personal lives. This grants them a better understanding and knowledge of the Web, and digital technologies in general.

COMPUTERS ARE ASSOCIATED WITH WORK

“They are more familiar with the Internet through their phones rather than computers.”
– Informal educator

We observed that many teenagers own at least a smartphone and have a tablet in their home, but have no computer. A tablet is often considered a replacement for a computer.

Many teenagers considered computers devices reserved for work and professional use, and therefore were not interested in owning one. With no computer at home, teens need to visit the library or school to access one, which makes them less likely to use one voluntarily.

This paradigm makes it difficult to encourage more proactive consumption, more intensive use of the open Web, or even content creation. Indeed, smartphones are often used during class, in between tasks, while commuting, with friends, or during a meal.

“They feel ownership when they are on mobile. They associate computers with work. Mobile is personal and fun.”
– Informal educator

SOCIO-ECONOMIC ENVIRONMENTS AND MINDSETS

For both generations, we observed that a participant’s socio-economic and family environment impacts their mindset. We met families where parents teach their children to code online, and families where parents are overwhelmed and not using the Internet at all. Although children are capable of learning web skills independently and from other sources, it is clear that their environment influences their online behaviors. Some children need encouragement, whether from school, parents, mentors, peers, or self-discovery.

We also noted a major difference between teenagers and parents from comfortable and wealthy communities and those from lower income communities. Access to learning opportunities is dramatically different: the Chicago Public School System is lacking resources, but private schools can afford to run Minecraft workshops and give Chromebooks to students. Security and access to libraries also differ.
INFORMAL LEARNING OPPORTUNITIES ARE LIMITED

Chicago has a wealth of afterschool programs, but a shortage of open Web learning opportunities tailored for young people.

Programs sometimes offer making experiences (mixing digital and physical objects) or focus on specific products, but we did not observe any programs that teach kids about the open Web. These programs exist, but they aren’t always accessible to students.

The learning opportunities that seem to be missing are:

• **Interest-driven learning approach**: where students discover the Web through a lens that interests them,

• **Informal learning environment**: due to various constraints, learning digital skills often happens inside of a school and with a teacher. Kids may consider this “work,” which leads to less engagement.

• **Variety of subjects**: kids are often introduced to products like Scratch, Makey Makey, Arduino, and Code.org. While these are no doubt beneficial, they do not address early learning and discovery on the open Web — and sometimes cover sophisticated topics that are abstract to students.

• **Inability to bring learning home**: we encountered many programs where kids are unable to pursue their projects outside of the classroom. For example, the Makey Makey kit used in the classroom may be too expensive to have at home.

• **Learning products are not available on learners’ devices**: Chicago teenagers generally own iPhones and Android phones, and sometimes a tablet. Few learning products are available for these devices.

• **Web literacy education occurs in a formal educative system**, and is related to classroom subjects. Few of these activities cover subjects that matter to teenagers, like YouTube or Snapchat. As a result, few activities encourage students to think critically about the tools they use.

• **Digital citizenship**: most digital citizenship learning environments focus on the dangers of the Web. While these are important, they do not cover the positive aspects of being a Web citizen. Teenagers learn about security, but they do not grasp the bigger global Web, trapping them inside the “Instagram bubble.”

THE WEB IS IN ENGLISH

In certain communities, the English language remains an extensive barrier to using and leveraging the Web. This phenomenon was particularly apparent among adults in the Hispanic community (but did not appear to affect their children, who likely grew up in the U.S. and learned English in school). Chicago has the fifth-largest Hispanic population in the U.S., according to the Pew Research Center Hispanic Trends Project.

“There are lots of information in English. It is hard to find things in Spanish.”

– Parent

“This course is specially for the Latino parents. None of them speak English.”

– Digital Skills trainer for adults
Skins needed to move to leverage

**Navigating the Web**

In order to move beyond limited use, users must be able to navigate the Web. This includes learning how to search for information, where to find it, and getting a sense of the different kinds of information available. With this competence comes the ability to differentiate between a search engine, a browser, an app, a website, etc.

**Managing Information**

While navigating the Web is important, so too is the ability to make use of information online. Users need to be able to save, download, curate, and upload content. For example: the ability to find social security documents is an important skill — but users must also be able to download them. Having a 360-degree understanding of how content is published, found, and downloaded is essential for those hoping to leverage the Web.

We attended trainings that touched on this topic, and met learners who stressed the importance of these skills.

**Privacy and Safety Basics**

When individuals fear the dangers of the Web, they remain in environments that feel comfortable and easy to master. The Internet is often perceived as a scary and mysterious place.

For people to use the Web in a more profound manner, they need to learn basic privacy and safety skills like password management, website tracking basics, personal information protection, scamming and phishing awareness, and so on.

**Online Identity Management**

Both teenagers and adults expressed a desire to learn how to manage their online identity. This entails understanding life online, and how one is represented by the content they create and share. Understanding how online life relates to offline life will enable young people to learn the Web with heightened confidence.

**Web Culture and Etiquette**

“You have to be careful, I got into a fight once with a friend on Facebook. I regret and I cannot erase it — it’s too late because people saw it.” — Teenager

Mastering the basics of Web culture, etiquette and jargon is an essential part of evolving online. These elements regularly came up in conversations, both among youth and the older generation. They include forum behavior, writing proper emails, platform-specific dos and don’ts, spamming, all caps, trolling, hacking, and more. Many participants discussed

“We feel vulnerable when using the Web.”

— Parent

“We would teach them what is appropriate. There is definitely a divide in generations between what we think is appropriate and what is not when writing. For example, you can’t put LOL on a blog about cancer.”

— Informal educator and blogger

“‘If I were to teach you about the Internet, I would teach you: keep scrolling. Keep scrolling means don’t get involved in the discussions, you know, they will put you in trouble.’”

— Teenager

**Legal and License Basics**

Understanding the basic legal aspects of the Web is an important skill for anyone seeking to leverage the Internet. This entails understanding the different licenses and types of content, the different rules of each website, and more. Above all, web users should understand that laws and licenses apply online just as they do offline.

“I don’t usually look at the source of the image, I just take it from Google images.”

— Teenager

**Critical Thinking**

Among all the skills named by participants, the ability to think critically about Internet content was the most important. This competency extends beyond the Internet, as parents and educators expressed a desire to see their children and students develop this skill both online and offline. The ability to distinguish and analyse information is crucial for anyone moving along the Web Journey.
limited use
User stories and motivations

We collected stories from our research participants, which helped illustrate their motivations for moving beyond the limited use bubble. Below are some of the personal motivations we discovered.

FULFILL THE CREATIVE SELF
“i don’t have a lot of creative thinking at work, and i missed it.” – Blogger

When Paula discussed her relationship with the Web, she described a desire to develop her creativity. She learned to sew, to build things, to draw, and to cook, all on the Internet. She learned a great deal about arts and crafts techniques, but mostly she discovered things about herself and her potential. Her desire to create and her search for personal fulfillment led her to learn everything she could online; the Web became her inspiration and teacher. Today, Paula has several new skills and is able to find almost anything she looks for online.

ACTIVISM AND CURiosity
“I wrote this paper to bring awareness on the prejudices and discourage violence.” – Teenager

In the case of Samantha, a highly-developed curiosity and emerging interest in activism pushed her to pursue her interests online. At 14 years old, she decided to fight against prejudices she witnessed in her school and her community, and thus began online research to write a paper and express her views. Samantha’s research allowed her to better understand the subject, but also to express her view and fight for a cause important to her.

IMPROVE ACADEMIC RESULTS
“I have discovered a place to learn with the Internet. I like it because it has all the subjects. Do you know Coursera? Have you ever tried it?” – Teenager

Another motivation to explore the Web was the desire to improve academic results and attend a good college. Some teenagers noted they leveraged the Web to learn a specific skill they believed would be helpful to academic growth. This desire led teenagers to go beyond mobile applications and explore other online content.
limited use
Mechanisms and points of entry

AFTERSCHOOL PROGRAMS

“Chicago has the highest number of afterschool programs and this is probably linked to our public school system.” – Informal Educator

Chicago houses some of the most developed afterschool programs, and many of these programs offer digital skills learning opportunities. These programs constitute a major point of entry for teenagers to expand their knowledge about technology.

FORMAL EDUCATION

“We did some HTML lessons this year. It was just for a special day, code hour.” – Teenager

The formal education system remains a major entry point for youth. The discovery of the “real Web” and its potential often occurs through academic research, thanks to educators and professors. This discovery can also occur through events like Hour of Code, which is becoming more popular in the U.S.

FAMILIES

“My friend told me I could learn about video games at this club house, so I went and I discovered Scratch. And then I started using it everyday. I went to the club all the time.” – Teenager

Other learning environments can be found at museums and computer club houses, or are led by specific individuals and organizations. These environments can be less organized than afterschool programs, but still provide opportunities for teenagers to discover the Web.

Parents can also play an important role in discovering resources online. Parents who are comfortable with the Web and understand its importance generally want to pass on skills to their children and encourage them to seek useful content online. They therefore act as a point of entry to introduce their children to the Web’s possibilities. We met with parents who introduced their children to code and did online activities together; who taught their children about spamming, advertising, and Wikipedia; and who even taught their children to create online maps.

“We started using the online Oxford Dictionary to show them how to search.” – Parent

“My mother asks me for help, she can’t turn on the computer.” – Teenager

OTHER INFORMAL LEARNING ENVIRONMENTS

“We just started doing the Codecademy games with my daughter.” – Parent

A poster inside a school
Three requirements for leveraging the Web

✓ Understand what’s possible
✓ Ability to navigate and control
✓ Ability to critically assess content
These individuals may use the Web to fulfill a passion, improve their education, or find a job. While they too enjoy the Web in a light way, they differ from limited users in that they can seize the opportunities the Web has to offer, and they understand what is possible. They are aware.

We observed that people in this category often have access to a computer — even if they do not own one — and generally use the Web to keep up with a hobby (sports, shoes, hair, clothing, literature, etc.). It is often this interest that leads them to explore the Web; they are driven to discover everything they can about a specific topic. These users generally know how to navigate the Web for school projects, job searches, or to learn a new skill.

All of these behaviors imply a certain appetite for information and an understanding of the Web.

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Behavior

This category is comprised of people who engage with the Web beyond social media and entertainment platforms and who are able to leverage the Web to improve their quality of life.

“The biggest thing I want to teach them is how to effectively utilise the Internet.”

– Informal Educator
Blockers when moving to creation

Through our interviews, we identified obstacles users encounter when transitioning from consumer to creator online.

SMARTPHONES OFFER A LIMITED CREATIVE EXPERIENCE
Even with the most sophisticated smartphone, it remains difficult to create online. For example, maintaining a blog from a mobile phone reduces the amount of text posted by users, and editing videos on mobile is also difficult.

When building more open and advanced creations, one is drawn to a computer with a keyboard and more complex software.

RELIABLE CONNECTIVITY IS NEEDED TO CREATE
Lack of stable Internet access is also a blocker for users eager to engage in more substantial online activity, like downloading and uploading files. Affordability is also an issue – users are more likely to limit their online interactions if they cannot afford an unlimited connection. Furthermore, substantive quantitative research in Chicago highlights the differences between individuals who have access to broadband at home and individuals who can only access the Internet through their mobile device or public spaces. Findings from this research reveal that having a broadband connection at home impacts an individual's ability to engage in digital citizenship activities (Karen Mossberger, Caroline J. Tolbert, Allison Hamilton, 2012).

A LACK OF LEARNING OPPORTUNITIES TAILORED FOR YOUTH
Similar to what we note in the previous section, there is a lack of exciting and relevant learning opportunities that encourage youth to become Web creators. There are an increasing number of coding opportunities for youth, but these remain insufficient to stimulate interest and curiosity. Programs available today appear to be:

• Punctual: during an event, informal, in a school, or a weekend workshop (MakerParty, Hour of Code), thus limiting youth’s interest and opportunities
• Formal: studying code still requires one to follow post-secondary studies
• Disconnected: we noted an important gap between opportunities in after-school programs and the way they relate to learners’ personal interests. This often results in students abandoning the subject once the workshop or program is over.

“I wanted to teach the Internet and show them the basics, but I can’t access the platforms on this network, so it’s not worth it.”
– Digital skills trainer

“Finding a mentor can be difficult

Difficulty meeting a teacher, mentor, or peer able to teach digital skills remains a blocker for many. Despite the “Maker Movement” bringing attention to hands-on activities, we lack passionate teachers. Informal educators are more inclined to share their passion for technology, due in part to teaching not being their primary job.

LACK OF MATERIAL RESOURCES
Difficulty accessing physical resources, like a teaching space, can present major constraints. For example, we met an informal educator who provides digital trainings for adults. He was mainly working with members of the Hispanic community, and his curriculum essentially consisted of Microsoft Office training. When asked about his limited curriculum, we learned he was restricted by the university. Indeed, he was forced to conduct trainings in a school that blocked access to YouTube, Facebook, and other platforms.

Other constraints include relevant curricula, access to devices outside of the program, and the existence of informal learning opportunities, similar to the constraints listed in the previous section.

Socio-economic environments can also be blockers: when learners come from a lower-income environment, they are likely to experience transportation, security, and connectivity issues.
OPPORTUNITY COST

Learning to create online requires technical skills, from leveraging existing "ready-made" resources to learning how to code. The latter is sometimes an obstacle, given the effort required. Coding requires commitment, and without utility proof, not everyone is ready to take it on. Because this would take place outside of the formal education system, it represents an opportunity cost for youth.

Further, the 14 – to 25-year-old age group cites a lack of fun when learning code. Most of today’s playful programs, like Scratch and Lego, target a younger segment. When moving beyond Scratch, teenagers struggle to find a product they enjoy.

“I'm still making my games with Scratch, even if I need something more advanced now. But the other programs I tried… I don't like them. It was too hard. Now I have been focusing on school. At home I am quite busy at the moment. Once I graduate, I can go back to this.”
– Teenager

PERSONAL CONFIDENCE
AND CREATIVE FEAR

As Web users become Web creators, they expose themselves and their creations on the Internet. This process can be difficult for the creator, who may face:

• a lack of inspiration, and low confidence in their skills and ability to create and share content,
• an audience that can reject, troll, or ignore the content.

This difficulty leads some to abandon the creative process, and saps self-confidence.

“I would see people reading my blog, but people did not put any comments and that was so frustrating.”
– Former blogger.

“They were afraid of saying the wrong things, and putting their words out there. I wanted to show them the Internet is not a school paper.”
– Informal educator

CREATING ONLINE IS ONLY FOR CELEBRITIES

“Why bother, no one will follow me.”
– Teenager

We also observed a strong culture related to Internet celebrities, especially among teenagers who closely follow their favorite web stars. This massive cultural phenomenon creates personal blockers for young adults, who tend to associate online creation with a fan base and a certain level of fame. Today, the most famous bloggers, YouTubers, and Instagrammers are often paid for their content, or find other ways to make a career out of content creation.

“Can this make me famous?”
– Teenager

This phenomenon creates increasing social pressure among teenagers, who associate creation with fame and popularity.

“They had a hard time conveying their thoughts – huge barrier to being able to be creative. I would tell them they could use poetry, storytelling, etc. They would be stuck on the formal school structure.”
– Informal Educator
Messy is beautiful

On today’s Web, creators can encounter a “restricted area” where professionalism has taken over. Amateur web creators find themselves making next to professional designers.

We highly encourage reading Olia Lialina and danah boyd’s essays for a complete analysis of this shift in Web culture, especially among teenagers.

As noted so wonderfully by Olia Lialina in her essay, “Vernacular Web 2”, the taste and aesthetics of Web culture have also evolved, forsaking sparkling and messy homepages for the “clean” pages provided by Facebook, Wordpress, and many others. The value of creation has been replaced by the aesthetic standards imposed by these giants, which dictate various forms of content creation today.

This was also described by boyd in 2007, in “Viewing American Class Divisions through Facebook and Myspace.” Boyd describes the shift in perception from Myspace to Facebook; the latter appeals more to kids from higher income backgrounds who prefer the “cleaner” look to the messy Myspace pages.
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Skills needed to move to creation

At this stage, users generally master the majority of the skills previously mentioned to move beyond the limited use stage. In order to become creators of the Web, participants identified other skills:

**USING AND UNDERSTANDING EXISTING PLATFORMS**

“I like Blogger. I don’t get Tumblr. I’m not tech savvy enough.” – Blogger and informal educator

One competency that stood out in our interviews is the ability to navigate and leverage existing platforms and tools like Wordpress. Participants often expressed an overwhelming affinity toward certain features or platforms, and tended to choose ones they felt most comfortable with.

“I got lost on Wordpress to start the website, linking the website, I don’t know what’s happening here. I wish I could just click on a button.”

– Blogger and informal educator

This sentiment seems obvious when considering any digital product — but it matters because certain platforms can act as learning curves for users. For example, many users will employ bits of HTML language learned while using Myspace or Tumblr. If the web environment is comfortable and easy to navigate, users might explore these features further and continue their creative experience.

“It’s easier to teach Blogger to teens than Wordpress. The buttons were easier to understand. We used Blogger because most of them had Gmail accounts.” – Blogger and informal educator

“I tried the Wordpress editor. At first I thought, ‘oh it’s like MySpace.’ But you had to know the code. It’s easy to use and yet I can’t do it. It’s the most frustrating thing.”

– Blogger

**CODING SKILLS**

Despite existing content creation platforms, coding remains a paramount skill when it comes to creating on the Web. Participants most interested in coding either aspire to become web developers or are educators and parents who believe it’s essential for youth today. Coding was less interesting to participants who did not view it as a future job opportunity. We expand on the perception of learning to code on page 104.

“If you want to be a creator, you need code.”

– Informal Educator

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15. “Shipping” is the creation of a love story between two characters from a TV show. In the show the two characters are not dating, but the shipper believes they would do well together, so he creates an online fanfiction story to bring the characters together for the fandom community. The creator is called the “Fan shipper.”
leverage
User stories and personal motivations

“Being able to create things is amazing. Because a lot of time you don’t have the opportunity to create something, have ownership and people be a part of it.”
– Blogger

CREATING THEIR OWN FANDOM COMMUNITY

“Fan art inspires me to do something like this, and I want to make content like this and amaze them with what I love to do.”
– Teenager

Spending time in online fan-based communities is a popular hobby among connected youth. Indeed, the desire to create and cultivate an online community can contribute to individuals moving from online consumption to creation. In doing so, youth break out of a passive state and go beyond the limited use stage, discovering step-by-step what constitutes an online community.

“I’m pretty active on the Internet, I made my own fandom community. There are different communities in the Tumblr website, you could do fandoms. You can do shipping.15 It’s fan fiction and art.”
– Teenager

DESIRE TO IMPROVE A VIDEO GAME

In some cases, the desire to take part in the creation process, have a voice, and play a role motivates users. Take for example Brandon, who wanted to change aspects of the video games he plays. Brandon began using Scratch to learn how to create his own game, and step-by-step he indulged his passion.

15. “Shipping” is the creation of a love story between two characters from a TV show. In the show the two characters are not dating, but the shipper believes they would do well together, so he creates an online fanfiction story to bring the characters together for the fandom community. The creator is called the “fan shipper.”
"When I was playing, I started to think that I wanted to change this, and change that in the decors of the game. You know, the way it looked. I was thinking I wanted to make my own."

— Teenager

PERSONAL CREATIVITY AND PERSONAL GROWTH
Gabi created her own personal blog to express herself and share her story online. Her journey toward online content creation took her outside of her comfort zone; she set out to explore different online platforms, choose her template, create and organize her content, and share it. Today, reflecting on her experiences, she notes that blogging helped her grow and expand her point of view. She is now a more engaged and active citizen of Chicago, and blogging enabled her to develop skills she did not believe she had.

“Oh my god, blogging is so good for me, I have changed so much and learned a lot. I started my blog to express my creativity and improve my writing. I started taking pictures all the time, I just blew up, in terms of being open to the world.”

— Young adult, blogger

CUSTOMIZING A TUMBLR
When Anita created a Tumblr to share her favorite images, she grew frustrated at the template and curious about customization. This served as her introduction to HTML and other web languages.

“I love Tumblr, and I liked to change themes and customize. That is how I started to be interested in coding and that stuff.”

— Teenager

FINDING A JOB
For Alejandro, the desire to become a web developer motivated him to learn programming languages. Alejandro is interested in all things technology; he would like to become a professional coder and create software and games.

“I’m learning to code, I would like to make my own softwares. I geek a lot.”

— Teenager

WEB JOURNEY – LEVERAGE
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Mechanisms and points of entry for Web creation

INSPIRATION FROM OTHER CREATORS

When studying the personal stories of those who have begun to create content online, we observed one important common point of entry: inspiration from other creators. For example, Linda recalls finding help via various blogs, which led her to create her own and eventually inspire others.

“I started to blog myself when I started the process of ‘going natural’. YouTube helped me with the transition, and other blogs, too. It was really inspirational and helpful.”
— Blogger

Exposure to these online tinkerers and creators — whether fandom community creators or other bloggers — inspires others to learn and engage in the creative process.

The other mechanisms to start creating online are similar to those outlined in the previous section: after school programs, other informal learning environments, formal education, and families.

“I used to follow a losing weight blog – I would comment on her blog because I could relate to her. She was an inspiration, and I felt comfortable relating with her. It felt safe. But most other blogs I never comment.”
— Blogger

16. “Going natural” means no longer altering one’s hair with a chemical process.
“Creators” are people able to read and write the Web. They’re not just communicating, sharing, or searching online — they are actively contributing content and building the Web.

The “Creator” category encompasses users of various skill levels: the casual tinkerer who plays around with HTML; the blog creator; the Wikipedia editor; and the “master,” one fluent in his or her ability to digitally create. Ultimately, these are the people who shape the experience of the Internet for others. Whatever their skill level, “Creators” all share a common trait: the ability to customize what they see, and no reliance on existing platforms.

Chicago is one of the U.S.’s major tech hubs; it houses a thriving tech scene and a high number of web developers. For research purposes, we chose not to interview these individuals — we needed to spend as much time as possible with teenagers, parents, and educators.

Three requirements for creating on the Web

✓ Desire to use an authoring tool
✓ Ability to use existing platforms
✓ Inspiration and confidence
The global Web Journey
Similarities and distinctions with India, Kenya, Bangladesh and Brazil

As we studied the Web Journey in both Chicago and emerging countries, similarities and differences came to light. Although this comparison is limited by the qualitative nature of our research, we are still surprised by the strong similarities between studies.

The next billion people coming online are not that different in India and in Chicago. Designing products and programs for both audiences requires similar principles and efforts.
In emerging markets, technology is present, but has not yet infiltrated every part of the country. The contrast with Chicago’s modernity is striking.
In India, affordances to learn the Web are rare and generally accessible only to higher-income communities.

In Chicago, affordances to learn the Web are more common and accessible.
Still, online behaviors in Chicago and emerging markets are very similar.

Understanding of the Internet and its capabilities is limited in both communities.
This leads to youth in Chicago and emerging markets having similar mindsets. The similarity is even stronger when considering youth from lower income communities in Chicago.

In our participant sample from Chicago, we observed that the majority of participants who use the Web in a very limited way are also those with the lowest rate of computer ownership.

This awareness of what’s possible is limited by the characteristics of a mobile device: no keyboard, less complex software, limited use of the browser, screen size, primary perception of the phone related to calling and sms, cost of mobile data, and so on.

This behavior, plus the widespread adoption of smartphones, leads to a high digital literacy level in regard to smartphones and apps — but at the expense of computers and the Web.

According to the GSMA, around 90% of people in emerging markets come online via mobile. We learned this is often the case in Chicago, too. In Chicago, those “relying primarily on smartphones to go online are disproportionately young, minority and poor.” (Karen Mossberger, Caroline Tolbert, Allison Hamilton, 2012). This is similar to what we observed in India, Bangladesh, and Kenya.

As new Internet users come online through mobile, their understanding of and confidence in the Web and their digital skills — especially content creation — are shaped by the mobile applications they use most frequently. This often creates confusion about the nature of Web content. For example, users may not know the difference between a website and a Facebook page, or a personal blog and a Twitter account.

Among those from more comfortable socio-economic environments, we observed a higher confidence level and broader understanding of what’s possible online. This is likely related to the abundance of affordances for youth growing up in higher income neighborhoods. This behavior was also observed in emerging countries.

Despite income levels, the actual act of creating content on the Web does not seem to be more prevalent among youth from higher income populations. Indeed, our research indicates that even if their environment is different, many teenagers have similar online behaviors — namely, consuming social media content.

http://ijoc.org/index.php/ijoc/article/viewFile/1777/808
The main difference resides in their understanding of what the Internet is, and their understanding of what they could do.

Taking advantage of it remains a question of mindset.

From all the teenagers we met, we learned that social media platforms such as Instagram, Vine, YouTube, Snapchat, Kik, Facebook, and WhatsApp are the most used and considered the most interesting aspect of the Internet and smartphones.

Differences between the various countries reside in the trends within these different networks. For example, Facebook is the preferred platform for most of Bangladesh, but is only popular in Chicago among users from lower-income communities. Kik and Hike are alternatives to WhatsApp, and mostly used in Chicago and India due to differences in cultural norms and behaviors. Hike, for example, offers locally-relevant stickers to users, which led to its popularity.

These different trends within the social media landscape are fascinating; they highlight the cultural and social codes of each country and provide a better understanding of the population.

In each country visited, Facebook is a main entry point for adults coming online at a later stage. It acts as a point of entry for parents in Chicago and also in India, Kenya, and Bangladesh, and was often the main motivation for starting to use the Internet.
INTERNET COMPREHENSION AND OPPORTUNITIES ARE HIGHER IN CHICAGO

While each person’s comprehension of the Web is unique, we observed a general heightened awareness of the Internet and new technologies in Chicago. This might be related to the community, or to living in the third-largest city in the U.S., where technology is omnipresent and inescapable.

In India, Kenya, and Bangladesh, technology is growing, but has not yet infiltrated every part of the country.

MOBILE DATA, CYBER SPACES, AND COST OF DEVICES

The high presence of cyber cafes and LAN houses in emerging countries evidences the need to supplement Internet access. In Chicago, these businesses are obsolete, and people can access the Web easily.

Emerging markets also face higher mobile data costs and lower signal quality and coverage. For example, the best connection available in Bangladesh is 3G, and can only be detected in some parts of Dhaka, the capital. In Chicago, 4G is available.

The difference between people’s devices is also striking. In emerging countries, research participants could only afford Android phones, and very few owned high-range devices. iPhones can be considered quasi-absent in emerging markets — but in Chicago, 62.3% of participants owned an iPhone. This can be explained by the different pricing models, which enable anyone to get a free high-range smartphone by signing a multi-year contract.

In emerging markets, this pricing model is much less frequent (or nonexistent), and it’s difficult for users to purchase a high-range smartphone. In Chicago, the availability of government assistance like food stamps also allows people to divert spending toward technology and entertainment devices. This is a fairly common behavior among low income households.

“Everyone has an iPhone 6 here.” - Informal educator
Findings

- Being Internet famous is better than just being famous
- Remixing for fame
- Learning code is not appealing
- There is a gap in the learning products offering
- Libraries are a safe zone
- Parents and teenagers don’t experience the same Web
Being Internet famous is better than just being famous

Youth from Chicago harbor strong feelings about Internet celebrity. Internet fame is a major motivator for teenagers when they engage on the Web and construct their online identity. This paradigm is so strong, it can shape the adoption of certain features — or an entire product. For example, we observed this was an important factor in teenagers’ interest in Webmaker. The need for recognition is strong and measured in various ways: by the number of followers and friends on Facebook, Instagram, and Twitter; by the number of views on YouTube; by the number of likes, the number of comments, and so on.

This behavior gave birth to neologisms and idioms such as “Facebook Famous” or “YouTube Famous. This is the “x Famous” model, where “x” represents a social platform where young people hang out.

This has an after effect on many digital products and communities, including those related to formal education and identified by teens as “work.” For example, teens look for fame on products such as Edmodo, an assignment platform where students collaborate with teachers and parents.

“Miss, I was about to become Edmodo Famous!”
– Student

YOUTUBERS
According to a study by Variety with 1,500 U.S. teenagers, YouTube stars are now more famous than “normal” celebrities. This may be due to famous YouTubers uploading videos of themselves, something anyone can do. This makes them appear more approachable, and allows teenagers to relate to them better than non-Internet celebrities.¹⁸

One interesting effect is that Chicago teenagers have more exposure to remix culture than teenagers in Kenya, Bangladesh, and India. This heightened exposure has lead to a more general acceptance, and sometimes enthusiasm, from Chicago youth.

“Remixing is cool — it’s everywhere. So many people do it now, it’s like Dubsmash and other stuff. You add voice or video. And we know it started from you.” – Teenager

However, despite an ability to cite remixes they make or enjoy, many teenagers do not seem to:

• qualify those contents as “remixes,” a phrase that is mostly reserved for the music industry. Rather, they label them “hilarious” videos,
• be aware of or grasp the mechanics of intellectual property and licensing,
• refer to remixing as a creative experience. Instead, they see it as a funny Internet discovery.

“I don’t even understand the licensing part.” – Teenager

When asked about others remixing their own content, teenagers often had the following reactions:

1/ **No way is this going to happen.**
   “If I put all my heart and soul in this dot and they remix it, I’ll get mad. Even if they turn my dot into a masterpiece. Even if it’s just a dot. I’d be mad or we gonna fight.” – Teenager
   “Why would you change the colors of my project? You could just tell me you don’t like them and I’ll change them.” – Teenager

2/ **This could be interesting if it allows people to build on my story or to find each other.**
   “I would be happy about it if it inspires people. But I’d like my creation not to change.” – Teenager

3/ **I would be okay with remixes if they make me famous.**
   “If people remix me it’s good, as long as I have the credit and people see I’m the original creator! I will become famous for sure.” – Teenager
   “I’d try it. We’re gonna be famous.” – Teenager
   “People can get famous from these things.” – Teenager

We observed that remixing content or being remixed is highly connected to Internet celebrity. It is seen as a proof of interest in content, which leads to a higher online social status. In other cases, remixes were seen as an inspiration for other people to start creating their own stories, or as the birth of a new community.

We also note that some teens profoundly reject the remixing of their own creations. They note they don’t understand why anyone is allowed to touch their creation.
INTELLECTUAL PROPERTY AND LICENSING

Teenagers have very little awareness about the different rules and licensing behind remixed content. Many are unaware of the consequences of publishing under a Creative Commons license, and learn them after the fact.

For example, one teenager was not aware that publishing his video game on Scratch could lead to other people remixing it. When we told him, he removed it to prevent people from “stealing his ideas.” Also, we frequently observed a lack of understanding about what is or is not possible with content published by others online.

As Andy Baio mentioned in his talk “Cut, Copy, Paste,” “We have turned every teenager with a computer into a criminal.”


A similar comic was shown to participants as a Webmaker content prototype. It encouraged teenagers to remix and change the story, continue it, or color it.

“The community of shoe lovers who had dramatic accidents.” A teenager was inspired to let others remix this project, so they could create a new community of interest.
Learning code is not appealing

“All I hear is ‘code, code, code!’ OMG it’s so boring, tell that to my cousin who is obsessed with the Kardashians...”
— Young adult, blogger

Despite trends that promote learning code and numerous initiatives and digital products to teach code, we observed in Chicago that coding is not perceived as a desirable or gratifying skill, especially by teenagers and parents, and even by some educators.

“Coding is like the liver and onions, it’s the thing you have to do, but you don’t like it.”
— Informal educator

“Code in itself is a strong buzz word. Does it even control your computer? No. We need to teach more to kids. Its one of the switches — we need to learn the different switches and how they connect together.”
— Informal educator

CODING IS SEEN AS A MINOR SKILL FOR PERSONAL DEVELOPMENT AND DIGITAL LITERACY...

Teenagers perceive learning computer programming as something specific to engineering, a vocational activity not fundamental to individual growth and enrichment. It is also viewed as a minor skill on the path to digital literacy, less important than problem solving, critical thinking, online communications, searching the Web, and other skills.

During our interviews, coding only came up a few times as a necessary digital literacy skill. More common were “soft” skills like critical thinking.

“My understanding of digital literacy is not through coding.”
— Informal educator

Coding was often seen as just one tool among many for creating anything from web pages to mobile applications. Even when we hypothetically proposed that participants...
could master coding by simply snapping their fingers, very few expressed interest.

Without a clear use case, research participants had no interest in learning to code.

“Coding is just one switch among many.”
- Informal educator

A SHARP CONTRAST WITH YOUTH’S IMAGERY AROUND CODING
This perception of learning programming languages, technical skills, and their utility is even more interesting when contrasted with the imagery associated with code. In many of our conversations with young people, hackers are mentioned several times. They are described as web experts capable of both good and evil, with the “white hat” hacker portrayed as a sort of “web hero.” Some teenagers expressed a desire to become “white hat” hackers in order to battle the “black hat” hackers. “White hat” is a status requiring extensive coding skills — yet learning to code is not appealing to most young people.

There is a gap between what gets students excited about computer skills, and the enthusiasm to actually start learning.

This gap is also visible when students share their enthusiasm for fairly technical products, such as Arduino. Arduino was perceived as one of the “coolest” products because of its difficulty. When teenagers were able to create something with Arduino — even if it was with the help of an educator — they felt proud and talented. However, they did not feel they could use Arduino on their own.

“Arduino was my favorite because it does not look like something someone in this class could do. It’s really cool.”
- Teenager

Popular products and organizations like Scratch, LEGO Mindstorms, Codecademy, and Code.org have helped bring “coding” to center stage. This sometimes leads to confusion between “learning how to code” — with the aim of mastering a specific language — and “coding to learn,” with the aim of using computational thinking to develop other skills like problem solving. For more details on this topic, we encourage reading the work of Papert and Resnick.21

This image of hackers goes hand-in-hand with a certain popularization of the term, which is used in digital workshops and afterschool programs to describe remixing or creating, not activities conducted by hacker groups.

“Hacking means taking something that is there, and making it yours, changing it to make it do what you want.”
- Teenager

... WHICH IS DIFFICULT TO LEARN AND MASTER
Teenagers, young adults, bloggers, informal educators, parents, teachers, and other participants in this study referred to learning code as tedious, and a skill requiring full-time secondary studies and a passion for computers and technology.

“It looks scary, which discourages me.”
- Teenager

There is a gap between what gets students excited about computer skills, and the enthusiasm to actually start learning.
Through all of our interactions, especially with young adults and educators, we observed the existence of a significant learning gap between the different learning products. Once youth get comfortable using a product, there is a hesitance to try something else and to go beyond their favorite platforms.

This scenario was especially visible among Scratch users, but similar gaps can be observed with other products, whether they’re intended learning products or not.

**THE SCRATCH GAP**

Scratch enables anyone to create various media, including games, through a simple and friendly “building blocks” interface. However, young people like Brendon sometimes reach a point where they would like to take on new challenges. They want to improve their games and introduce more complexity. Although the Scratch ceiling is very high, learners can become stranded when searching for another platform that matches both their desire and comfort level. Other video game design platforms appear too serious, too difficult to navigate and understand, or too technically advanced. This phenomenon is discouraging, and causes youth like Brendon to abandon their creative ideas.

**RESEARCHER:** Have you tried other [learning] products?

**PARTICIPANT:** Yes, but I don’t use them. Gamemaker, Unreal Engine, Greenfoot, I couldn’t quite stick to it because I never understood Java. It’s more like text files, that’s why it always looks quite complicated to make a game, so it looks very scary to me, which discourages me.

Excerpt from a conversation with an advanced Scratch user.

---

**Scratch** enables anyone to create games using building blocks.

**Unity** is a more sophisticated software for creating video games.

---

There is a progression gap between different learning products.
MakeyMakey is simple, and teenagers can learn to use it on their own without coding skills.

Arduino is a more difficult product requiring step-by-step guidance from mentors and coding skills.

Similar frictions can be observed between other products, or even inside products themselves. For example, the transition from using templates to creating original ones can create friction for learners.

**CODE EDITORS**

Teens are often introduced to various bits of HTML and other coding experiences through products like Wordpress or Tumblr. Once this discovery occurs, the path to actually edit the code is difficult, abstract, and frightening, which leads youth to abandon their work. Sometimes, youth believe they lack the required skills to continue.

This experience is different from the ones that occur in classrooms or computer clubs, with the use of learning products like Code.org activities, Khan Academy, or Thimble (Mozilla’s online code editor). These activities offer great step-by-step approaches to learning code, with the goal of teaching the learner a specific language or Computer Science. If a 16-year-old teenager wants to edit a Tumblr theme, he is unlikely to go on Khan Academy and sign-up for a course titled “Programming” or “Computer Science.” This is because the gap between customizing a blog and learning programming is too wide.

There is an opportunity to foster creative learning experiences where youth are already hanging out and having fun, instead of directing them to prescriptive learning tracks that often feel overwhelming and disconnected.
STEP 1
Click “Edit HTML” in your blog to customize your theme.

STEP 2
Look for help inside Tumblr. Discover this HTML guide.

STEP 3
Click “Learn to make awesome Tumblr themes.” This allows users to sign up for a free General Assembly course online.
"I would let my kids go to an afterschool program in a library, but not in an informal place. We have too much security issues. A library is safe. It's not a plain building or office." – Parent

Teenagers view libraries as a place to access the Internet and other resources for free while hanging out with their friends. With the rise of YouMedia, a "21st-century teen space" for fostering digital experiences and learning, libraries have grown in popularity among teenagers. Teens are free to use computers, hang out with their friends, and participate in creative activities with help from staff.

"The library started YouMedia and my son is now interested. He is comfortable there because it’s relaxed, they can eat there, that’s allowed. They can do film, they can do many different things, he loves it. It's different." – Parent

For the older generation, libraries offer help. The Cyber Navigators in the Chicago Public Library often act as a point of entry for those who have little knowledge about technology. They help the less fortunate navigate the new digital world.
Adults and teenagers don’t experience the same Web

In this section, we explore learnings and observations gleaned through our discussions with parents and adults in Chicago.

**TEENAGERS HANG OUT WHERE ADULTS DON’T...**

In the same ways that teenagers look for unique experiences and independence in their offline life, we identified similar behavioral patterns in their Web use — and, more specifically, on different social media networks.

"Their one thing is social media. It is slightly frustrating. It is so bizarre to me that they only see social media.”

— Parent

These behaviors lead to confusion and strong incomprehension from adults, who constantly worry about the online life of their children or students.

Parents and educators expressed specific concerns about young people today using the Web in limited ways, like restricting themselves to social networks. Additionally, we encountered more traditional fears and concerns about security, privacy, and technology addiction. The latter topics are well covered by danah boyd in her book, it’s complicated.

**... SEEKING FUN, WHILE PARENTS SEEK UTILITY**

In studying perceptions of specific and well-known social networks, we observed emotional and behavioral patterns:

- **Adults** more often describe their adoption as one motivated by performance, practicality, and more generally problem solving.
- **Teenagers** are more likely to adopt a network based on its popularity among their friends, but especially for its capacity to generate fun experiences. They thus avoid media used mainly by adults, or avoid the utilitarian aspect of said media, instead seeking social and casual experiences.

"We grew up with the Internet developing, so we know more. It baffles me that they don’t utilize it.”

— Parent

For a thorough understanding of online behaviors and the adoption disparities between teenagers and adults, we highly recommend reading the extensive work of boyd, as we recognize we barely scratch the surface here.
Deep dive on teenagers

The threshold diagram aims to outline our Webmaker user segmentation based on motivations and constraints. We identified different behavioral patterns, which allow us to define three main groups:

Teenagers who are likely to embrace Webmaker.

Teenagers who are undecided and could be motivated by specific triggers.

Teenagers who will not use Webmaker, due to either rejection or inability.

We outline the main characteristics of each group in the following graphic.
Teenagers
Webmaker User Segmentation

**Embracing Webmaker**
- Is creative and curious, looking for new platforms and experiences
- Owns a mid- to high-range smartphone, tablet, or computer
- Enjoys the remix feature
- Enjoys creating content online
- Enjoys communities of interest

“OMG! This would be perfect for fandoms.”
– Teenager

**Undecided about using Webmaker**
- Trend setters and trend followers; motivated by popularity and social features
- Satisfied by existing tools; motivated by use-cases and examples

“I don’t use Pinterest because no one in my school uses it.”
– Teenager

**Rejection or inability to use**
- Not interested in sharing or creating online
- Looking for more advanced tools
- More interested in gaming
- Satisfied by existing tools
- Only wants to use popular tools
- Has no access to devices (smartphone or computer)
- Has little or no access to reliable connectivity, WiFi, or mobile data
- Is not authorized by guardians/parents

“I’m currently learning Python so I can make my own software. I want to take computer sciences when I go to college.”
– Teenager
She recently wrote a one-page paper on prejudice, which she created "just for fun" to teach others.

Samantha owns a middle-range Android smartphone, which she uses often to play games like Subway Surfers. When introduced to Webmaker, Samantha was excited by the discovery gallery, where she could view stories by others. She is particularly enthusiastic about the "Maze" navigation and believes she can use Webmaker.

"Oh, the maze is so cool!"

"You are making your own website. Now I know I can do it, too!"

Samantha stood out from her peers interviewed in the same school. She has a different mindset, is intensely curious, and has a strong appetite to learn new things. Her technology awareness is limited, but with guidance and mentorship, she can achieve great things.

Samantha is curious about many things, with a special passion for reading and writing. She particularly loves reading stories about vampires. Her favorite website is Wattpad, a social network for writers. She uses it regularly to check on the latest stories from others, and will frequently comment on stories to ask questions or suggest plot developments. She has not yet published a story of her own; she is shy.

Samantha is interested in many topics, and lately, has started working with an organization fighting domestic violence. She discovered the organization when they visited her school to give a talk, and she felt she could participate.

“I don’t need to work, but it caught my eye. I thought I could try to do some action.”
Naylah is 15 years old and lives with her mother and little sister in the South Shore district of Chicago. She works part-time at a journalism job that she found through AfterSchool matters.

Naylah is excited to attend college soon, and cannot wait to join a sorority. She wants to experience the sisterhood, and believes sororities are a good way to give back to the community.

“I love the Internet. Especially Snapchat and fashion.”

She enjoys using the discover gallery on Snapchat to learn new things about music, fashion, and international news.

Naylah has an iPhone 4, and uses it mostly for Snapchat. She loves to send silly things to her friends, like videos of herself in class. She also enjoys Twitter, Instagram, and other social media platforms. She edited a Wikipedia article once, “just for fun,” and changed an article by replacing “the sky is blue” to “the sky is brown.”

“I was bored and I wanted to see what happens. That’s it. I don’t trust Wikipedia because everyone can write.”

She considered creating her own YouTube channel, but she has not done so yet; she felt lazy and shy. Once Naylah wanted to create a hair tutorial using Prezi, but gave up because she had trouble organizing her thoughts and it was too messy.

When introduced to Webmaker, Naylah expressed interest in creating tutorials. She was especially attracted to the remix feature, which could make her project go viral, and the fact that it makes her think about Prezi.

“I always wanted to do that when I become a hair stylist”

Naylah is tempted to try Webmaker, but believes it is not yet popular enough, and that we need to add more creative features.
John thinks Webmaker is interesting, but not made for him. He prefers using existing platforms such as Instagram or Twitter to share content, and does not need another tool. He would rather use tools like Wordpress to make his website, because they provide more capabilities than Webmaker.

“I am a producer, I made webisodes for our show.”

John is 17 years old. He is in a jazz band and loves to play video games with his friends. He uses many social media platforms, but his favorite is Twitter, which he finds hilarious.

“Everyone is on Twitter.”

John also has a passion for television shows, and he dreams of making his own. He started a web series with his friends, and he acts as producer and organizes everything. John is able to create his own website with existing tools; he had to make one for a project.

He uses the Internet to read about different trends. Recently, he wanted to follow the debate about the blue dress.
Deep dive on informal educators

The threshold diagram aims to outline our Webmaker user segmentation based on motivations and constraints. We identified different behavioral patterns, which allowed us to define three main groups:

Informal educators who are likely to embrace Webmaker.

Informal educators who are undecided and could be motivated by specific triggers.

Informal educators who will not use Webmaker, either due to rejection or inability.
Informal educators
Webmaker user segmentation

Embracing Webmaker

- Students have Android devices
- Has reliable Internet access in their learning environment, and students have Internet at home
- Is looking for a simple and fun tool that allows students to express their creativity
- Is interested in fostering soft-skills learning
- Is interested in teaching the Web, but not necessarily programming languages
- Understands Webmaker and finds it easy to use

“I love that you do the secret learning thing.”
— Informal educator

“We used this product because we really wanted students to master HTML and CSS by the end of the program.”
— Teens program manager

The thing I love about MakeyMakey is that it is so easy to use right out of the box. But you can also do so much with it. The potential is huge.”
— Informal educator

Undecided about using Webmaker

- Already satisfied by other products; motivated by popularity, examples from peers, high ceilings, and student demand
- Is uncomfortable with Webmaker; motivated by trainings and curated curricula

Rejection or inability to use Webmaker

- Is teaching design or programming to students
- Has specific learning outcomes and KPIs, sometimes depending on external stakeholders
- Teaches tech-savvy students, for whom Webmaker would be too simple
- Is loyal to other learning products
- Is looking for more hands-on physical making experiences
- Does not see learning outcomes with Webmaker
- Students do not have access to technology
“They had a hard time to convey their thoughts. There is a huge barrier for being able to be creative. I would tell them they could use poetry, storytelling, etc. They would be stuck on the formal school structure.”

Linda is enthusiastic about Webmaker because it’s simple to use. She enjoys the product as a storytelling tool, and believes teenagers would use it to learn about themselves through the creative process.

“This is great for personal learning. If you are the creator you learn about yourself. This is great for community learning and interest-driven learning.”

Linda is a blogger and informal educator who runs an afterschool program that teaches students to blog. She discovered blogging herself when seeking health tips and hair advice online; Linda uncovered a new world where she could relate to other bloggers.

“I wanted them to build a relationship with writing — I chose blogs because they are pretty relaxed. I wanted them to be empowered to make a statement. Once they are over their fear they have fun.”

Linda believes in the positive effects of storytelling, and wants to teach youth how to use the Internet to speak their mind and bring positive change into the world. Linda is not interested in coding skills, and although she believes they can be useful, she believes other skills take priority. For example, she aims to teach her students how to search for resources online, how to organize their thoughts, how to uncover the Web’s possibilities, and how to properly share their stories.
George

George is an informal educator who runs regular workshops in Chicago. His passion is encouraging students to create in the physical world. Before running workshops, George produced videos and focused on his art.

“I identify as an artist more than anything else. Definitely not as a teacher.”

“I’m originally a filmmaker; I had no interest in computers or LOGO as a kid.”

During his workshops, George uses MakeyMakey, cardboard, and Scratch to encourage learners to build things. George does not believe in teaching kids how to code, but rather how to express their creativity and find personal growth through different activities.

George is very faithful to Scratch and MakeyMakey, which he views as excellent products that allow users to learn computational thinking and connect with the physical world.

When introduced to Webmaker, George was confused about learning outcomes and had the impression we were offering yet another social media platform, or tool for creating websites.

“There are already lots of tools to make websites — not as cool as this — but why would they use you if they don’t use the others?”

It’s fairly unclear to George what a student can learn by creating content with Webmaker. Moreover, George has the impression that Webmaker promotes sharing over making, which to him is not an ideal motivation for learning.

“It has to be an internal motivation, a strong one, not an external one like sharing.”

Today, George is unlikely to use Webmaker due to a strong attachment to other products and the absence of use cases. However, he is likely to try it and change his mind if he sees other educators using it, and if he sees interesting Webmaker activities he could build on.
James teaches computer science at a private school and also runs after-school programs at a public school. He has a true passion for teaching digital skills to youth. When James teaches his formal class, he covers robotics, game design, and general life online.

James does not spend time on social media; he feels he is too old, and that it doesn’t provide much value. Social media is used by young people to hang out with their friends, he says, and he feels disconnected from that environment.

“I don’t think I have posted on Facebook. Ever. I don’t want anything out there that I can’t control.”

He ascribes more importance to design, robotics, and video game design, which he views as valuable skills.

When James discovered Webmaker, he did not understand the point and was disappointed there were no coding activities in the app. He does not see any learning happening, and believes it is too similar to Instagram.

“Why would kids use it? They already have Facebook and things like this.”

“I see it being used in English or social — but not in tech.”

James is waiting for us to build a code editor, which he says would “definitely [be] interesting.”
The threshold diagram aims to outline our Webmaker user segmentation based on their motivations and constraints. We identified different behavioral patterns allowing us to define three main groups:

- Teenagers who are likely to embrace Webmaker,
- Teenagers who are undecided and could be motivated by specific triggers,
- Teenagers who will not use Webmaker, either by rejection or inability to use.

We outline the main characteristic of each group in the graphic.

Recommendations
Recommendations

There is no such experience as ‘just the web’

At the very beginning of the Web Journey, when someone is new to the Web, they are also likely new to technology in general. Both in emerging markets and developed markets, we observed the true importance of understanding and mastering the device being used, and the device landscape in general.

We also learned the concept of web literacy is confusing to our audience — it appears theoretical and abstract. Many are more familiar with the expression “digital literacy.”

When teaching and advocating, we suggest presenting the Web in the context of technology in general. There is no such experience as just the web.

Even with the best infrastructure and affordances, taking advantage of technology beyond limited use is a question of mindset. This is what leads to so few differences between youth in emerging countries, where affordances are lacking, and youth in Chicago, where affordances are flourishing. Hence the need for us to collaborate with partners and go beyond basic web literacy skills when developing our programs. It is about inspiring youth to understand what’s possible with technology and the Web. The perfect set of skills is not enough.

Skills are not enough. Inspire curiosity and a growth mindset.

When teaching and advocating, we suggest presenting the Web in the context of technology in general. There is no such experience as just the web.

We recommend clarifying the way we present our work. This does not necessarily mean changing our language, but instead defining it more clearly and ensuring it is accessible to all.

When advocating for web literacy, we should go beyond Read, Write, Participate and hone our programs to spark the growth mindset.
Learning products

THE WEB IS THE PLATFORM?
Webmaker is often associated with existing social media platforms like Pinterest and Instagram. Participants were confused by this new platform and often needed to compare it to something familiar in order to identify it. For example, many asked, “What platform is it?” or “Where does your app go?” Due to the use of mobile devices, participants were under the impression they would create mobile applications that would appear in an app store. When we explained that “the Web was the platform,” and that Webmaker projects lived online, we faced further confusion.

CONTENT WILL SHAPE ADOPTION OF WEBMAKE
The “making” capabilities of Webmaker are simple when compared to other products, like App Inventor. This means users who discover Webmaker through their mobile phone are likely to first be attracted to the content rather than the tool.

Many teenagers were eager to gather in communities of interest within Webmaker. Rather than identifying with communities driven by the product (Webmaker) or the organization (Mozilla), users would identify with communities for shoe lovers, natural hair trends, funny videos, fandoms, sports, and so on.

⇒ The difference between third-party platforms and the Web is precisely the kind of concept Webmaker can teach. We suggest emphasising this in both the software and our curricula.

⇒ We recommend ensuring these desires are represented in our product, and providing users with the opportunity to create these communities. This could be implemented through the use of content search features like hashtags; through a gallery featuring diverse and attractive content; or through other methods.

⇒ What is our vision for Webmaker?

<table>
<thead>
<tr>
<th>Where kids are introduced to code</th>
<th>Interest driven?</th>
<th>Learning product?</th>
<th>Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wordpress, Tumblr, Myspace ...</td>
<td>YES</td>
<td>NO</td>
<td>Code for customization and creativity</td>
</tr>
<tr>
<td>Code.org, Khan Academy, Codecademy, Thimble...</td>
<td>NO</td>
<td>YES</td>
<td>Learn to code</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When kids are introduced to computational thinking</th>
<th>Interest driven?</th>
<th>Learning product?</th>
<th>Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scratch</td>
<td>YES</td>
<td>YES</td>
<td>Code to learn</td>
</tr>
<tr>
<td>Makey Makey</td>
<td>YES</td>
<td>YES</td>
<td>Transform every day objects into computer interfaces</td>
</tr>
<tr>
<td>Arduino</td>
<td>YES</td>
<td>YES</td>
<td>Open-source electronic prototyping platform allowing users to create interactive electronic objects</td>
</tr>
</tbody>
</table>

⇒ Code as a creative feature and an introduction to computational thinking
FEATURE REQUESTS FOR MORE CREATIVITY
We received a tremendous amount of feature requests from each participant, often based on their experience with other platforms like PicCollage and Instagram, where the creative experience is richer. While we must make choices and trade-offs, we note the unanimous demand for videos.

⇨ When choosing new features to build, know that videos are a priority for teenagers. Also, consider gifs, stickers, and wallpapers, which are common in other applications and popular among youth.

WEBMAKER POSITIONING, CODE EDITORS, AND COMPUTATIONAL THINKING
We observed many gaps in the digital product landscape. These gaps existed both in products through which kids are introduced to code via their own interest-driven activities, and in learning products themselves. From editing their Tumblr theme to taking a web programming course, there seems to be an opportunity for Webmaker to provide a meaningful and fun learning experience for youth. We envision learning happening in steps: youth are introduced to web literacy basics and some code features via the mobile app, and then are introduced to computational thinking via a desktop version. This would bridge the gap between Tumblr and products like Codecademy.

⇨ Any future Webmaker code experience should enhance creativity for the user, and feature different levels of scaffolding. We recommend the Code to Learn philosophy, as opposed to Learn to Code.

DEVELOP WEBMAKER FOR IOS
Since we mainly aim Webmaker at Android markets, we did not face many traction issues. But in Chicago, the number of people who own iOS devices is astonishing.

⇨ To launch Webmaker in Chicago — and likely the U.S. — developing an iOS version of Webmaker appears paramount.

COMMUNITY FEATURES AND REMIX SOCIALIZATION
Since the majority of online activities in which youth engage are social in nature, we understand teens’ desire to see community features inside of Webmaker, and to be able to create content for these communities.

⇨ As we continue designing Webmaker, we suggest a strong emphasis on and prioritization of community and participation features.

⇨ Since remixing can be controversial, we recommend positioning “remix” as a social feature and building a happiness mechanism around it.
“MakeyMakey was my favorite. I loved how something so simple could be, like, something so big.”

— Teenager, talking about their favorite product

A true inspiration for our design principles.

COMMUNICATING LEARNING OPPORTUNITIES WITH THE WEBMAKER APP

When sharing Webmaker with the educator community, we often heard remarks like “I don’t see what this is for”; “Do you learn code here?”; and “Is it like Instagram? Then what do you learn?” This is partially due to the fact that we dramatically lower the bar for creation, which leads educators to believe learning outcomes are limited. It appears we need further communication and documentation of the learning possibilities within Webmaker.

Learning programs

We suggest building a set of Webmaker activities for the educator community. For example: Webmaker to teach storytelling; Webmaker to learn smartphone and Web basics; Webmaker as an introduction to code; and Webmaker to teach licensing, remixing, and open content.

CONTINUE THE MOZILLA CLUB DIRECTION

There is a need for regular and informal creative learning opportunities. Although Chicago’s landscape may appear saturated with afterschool programs, it is not. Existing programs touch only a part of the population, often take place in school settings, and can sometimes be prescriptive. There is an chance for Mozilla and its partners to develop a network of regular creative learning opportunities for both youth and adults, and to develop unique skills and expertise in this area.

Challenge: Chicago has a specific challenge related to the abundance of afterschool programs. Teens often receive a stipend to participate in a program, and now frequently ask to be paid or receive a gift card for participation. This is a fairly complex problem that can be studied and addressed by leveraging local expertise.

We suggest further investigation and mapping existing programs when developing clubs. Hive Chicago and the Hive Learning Network have incredible resources to make this happen. We suggest working with existing programs to co-design the club model and content, even if it leads to slight changes to existing programs or the creation of new programs.
CREATE AN OPPORTUNITY FOR STUDENTS TO TAKE LEARNING HOME
When kids are interested in a subject or technology, they often want to continue at home, beyond the program. We note that the most substantial learning impact is often achieved when driven by intrinsic motivation, when the learner is eager to pursue creation at home and during free time.

When building our learning products and programs, we should think about whether or not we are allowing the learner to continue his journey in his own environment. It will not always be possible, but we can partly influence it through our curriculum. For example, by ensuring each activity ends with “What else could you do by yourself?” or by co-designing the curriculum with the learner.

EMPOWER YOUTH TO SHARE THEIR KNOWLEDGE WITH THEIR COMMUNITY
Building on the previous point, we recommend further exploring youth empowerment and youth impact on communities. Because youth are often a point of entry for new Web users, empowering them and encouraging them to share their knowledge is important.

CHICAGO PUBLIC LIBRARY
Collaborating with the Chicago Public Library, whether through their youth program YouMedia or through the Cyber Navigators program, is an interesting opportunity given the positive social impact of the library and the number of branches across the city.

DEVELOP PROGRAMS WITH FAMILIES
Parents and communities influence youths’ technology mindsets and behaviors. They are also disconnected from kids’ online experiences, which creates tension. Bringing families together around topics like privacy, social media, and learning is an interesting opportunity. Parents from all socio-economic backgrounds expressed unease about their kids’ smartphone behavior, and are constantly thinking about the dangers their kids face online. Parents explicitly asked to learn about the “cool” aspects of the Web, not just the dangers. For example, parents want to learn Tumblr or Snapchat, so they can stay current. This might lead to less parental pressure on children and more trust between parties.

With the Parent’s Engagement Moonshot, Hive has the opportunity to develop these sorts of programs and provide opportunities to:
• Help parents understand youths’ online behaviors,
• Bring families together to discuss important topics like privacy,
• Allow families to learn about the Internet and its infinite possibilities.
Thank you

We are deeply grateful to the organizations who made this work possible.

Hive Chicago
Chicago Public Library
Digital Youth Network
DePaul University
Chicago Parker School
Code Creates
Gary Comer College Prep
YoLocali
La Casa
Enlace
Digital Atelier
Digital Divas
MacArthur Foundation
CivicLabs
YouMedia
Alder Planetarium

We are truly grateful to the 69 participants who welcomed us into their homes, their schools, their offices and their classrooms.

Thank you for sharing your life with us.

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Appendices

Appendix 1: 110 things to learn

We gathered this list of skills through various techniques, prompts, and activities with participants. We asked participants to tell us what they dreamed of learning for themselves, their children, and their students. We also asked them what they would teach us if they were introducing us to the Internet.

Below, in no particular order, is the list of skills gathered. For this project, we did not limit answers to "read, write and participate"; we wanted candid answers, which often lead to interesting surprises:

**FROM EDUCATORS AND PARENTS**

1. Writing skills
2. How to work together
3. How to talk to each other
4. Critical thinking
5. Empower students to share issues that concern them
6. I wanted to teach them that the Internet is not a school paper
7. Be empowered to make a statement
8. Learning coding to create
9. How to effectively utilise the Internet and find content
10. Internet is so much more than a six-second video on Vine
11. How to formulate your own opinion from research
12. What to share on the Web, and how to share things
13. Being responsible for their own post
14. Understanding the consequences of sharing online
15. Security and web design
16. Manage their online identity
17. Make them think critically about their presence online
18. We put things inside of a frame, and so people think they are beautiful. Just because something is on YouTube does not mean it’s good to watch. Kids should learn that
19. My understanding of digital literacy is not through coding
20. Critical literacy
21. Communicating ideas
22. Asking for help
23. Typing is a great skill to have
24. Paying attention to details
25. Powerpoint, Word, Excel

26. Find what they are looking for
27. Create their own thing on the Internet
28. Teamwork
29. Trying to solve a problem before you complain
30. Ability to read technical information
31. Identifying gaps; computers are stupid
32. Don’t be influenced
33. How to discover new opportunities from people around you
34. Using YouTube for science projects
35. Maths
36. Problem solving
37. Self-esteem
38. Digital journalism
39. Tech is not the answer
40. Humanistic qualities
41. Being aware of the resources out there
42. How to make a website to impact other people — the civic engagement aspect
43. How to be able to collaborate on a team
44. Understanding HTML and CSS
45. Storytelling
46. Being able to work in groups

47. Coding would be nice, but it’s unrealistic to think everyone would be interested
48. Being able to evaluate good information from bad
49. Using Google advanced search options
50. How to fully use a tool, like Google Maps. They don’t know they can make their own maps
51. Not necessarily to learn programming, but more to use the tools they have to create or do what they really want
52. To me, digital literacy is being able to navigate the Web
53. I teach Microsoft Office because it’s an important skill to get a job
54. Time management
55. Being responsible
56. We need to teach Facebook literacy
57. Icons and jargons

**FROM TEENAGERS AND YOUNG ADULTS**

58. Improve my writing
59. Use the Web for good
60. Finding content
61. Have an open mind
62. Accept opinions from others
63. Learn Japanese, for the anime
64. Learn to hack — but white hat kind of hacking
65. I would teach you search: it can be dangerous and helpful
66. Open Chrome but don’t click on everything, they will make other tabs and it’s confusing. Click on what you need
67. I would teach you security: watch out for who is out there
68. I would teach you privacy and stalkers
69. If I could learn one thing, I would learn to use the Internet wisely, I don’t use the Internet much now
70. I would teach you: never click on random sites, it can give you virus, I accidentally clicked on random ads and it locked my whole phone
71. I would teach you: if you make social media — don’t feed them negativity, just positive
72. I would teach you: just enjoy, have fun and just be you
73. I would teach you: privacy. It’s important not to invade privacy
74. Security and passwords: important for social media accounts, you don’t want people to mess with it
75. I would teach you to search for positive and good stuff
76. I would teach you Microsoft Word and typing
77. I would teach you being smart on the Internet
78. I would teach you a good browser so it’s easy to use
79. To learn: community participation — giving back and being part of something
80. Credibility, cat fishing
81. Collaborating and trying with others; feedback
82. To search: don’t believe everything you see
83. Skills: design that is attractive
84. Privacy: choose what you are sharing
85. I would teach you: never give personal information
86. Never respond to people you don’t know
87. Be polite and don’t talk about people online, no cyberbullying
88. I would teach you how to make a private conversation on Kik (messaging app)
89. I would teach you: have fun
90. I want to learn how to hack. I would hack into websites and social media, or bad people’s computers, and tell the police
91. How to organize my thoughts and make something look good
92. How to create tutorials
93. How to survive in a zombie apocalypse — hunting would be a useful skill
94. How to focus
95. How to think better
96. If I was to teach you, first I would ask you what you like to do
97. I would want to learn to design a game
98. I want to learn how to make swords
99. I want to learn hacking like a swift hacker. Because you can have anything at your hands like money and things
100. I want to learn to repair any device
101. Community leading
102. I’ll teach them what to press, what to press, don’t bring the juice — juice will mess up the computer
103. How to search — that’s it. Well, that’s basically all I do with Web: search
104. I would teach you: 1) never give your address 2) Be careful of the creeps 3) Keep scrolling
105. Keep scrolling means don’t get involved in the discussions, you know, they will put you in trouble
106. Internet lingo
107. I would teach you YouTube: how to watch videos
108. I would teach you all the social media. If you don’t learn the social media, you don’t learn the Web
109. I would show you how to be really good at it, typing like a pro, knowing everything
110. Someone who is really good on the Internet means someone who knows all the buttons. They know the computer
Appendix 2
Research methods and design workshop

Ethnographic research is based on immersion in a new culture. For this project, we gathered data through three main activities, allowing us to access a wide range of information and test our findings in various settings.

**OBSERVATIONS**
We attended many after-school activities and informal workshops, sometimes for interviews, but also just to observe. We attended meetings with the Hive team, in order to immerse ourselves in their daily work and get a wider perspective on the Chicago landscape. We attended meet-ups throughout the city like open gov nights to learn about the tech scene in Chicago. We hung out in schools, coffee shops, libraries, and other spaces to observe behaviors. There are many observation methods: walking down the street, engaging in conversation, or sitting silently in a workshop. They provide context and grant a glimpse into the participant's network. Participants are less likely to be shy and more likely to open up. You can also bounce back on the friend's answer and ask things like "Is she really always doing that?" making little jokes during the conversation.

**INTERVIEWS**
We combined various interview methods to achieve the best results. Each method has its strengths and weaknesses.

- **In-depth individual interview** — around two hours of discussion with one person, in a place of their choice. Their home is preferred, and their favorite coffee shop is second best.

- **In-depth friends interview** — around two hours of discussion with two friends, in a place of their choice. This method is preferred, as a friend's presence grants confidence and energy to the participant. A pair interview with a friend is different from a pair interview with a peer or family member, as it has a playful atmosphere and grants a glimpse into the participant's network. Participants are less likely to be shy and more likely to open up. You can also bounce back on the friend's answer and ask things like "Is she really always doing that?" making little jokes during the conversation.

- **In-depth pair interview** — around two hours of discussion with two friends, in a place of their choice. In this setting, the participants are not necessarily friends, but they have similar occupations and ages, and they belong to a similar group. For example, it can be two parents who don't know each other, or two teenagers from the same school but who are not necessarily close friends. It also allows for interesting debates between participants.

- **Short interview** — around one hour or 45 minutes of discussion with one or more participants. These interviews usually happen during an event. In the context of this project, these shorter interviews took place during or after a workshop or other informal learning activity.

- **Focus group** — around one-and-a-half hours of conversation with a group of more than four peers. This method is useful for gathering a wide range of answers, but is fairly difficult to implement and does not allow in-depth conversation. It is best used to select participants for a later in-depth interview.

- **Ad hoc interviews with strangers** — 10 minutes or more, these are spontaneous conversations with strangers who were not recruited for an interview. They are useful to learn about various aspects of the culture and cover subjects separate from your main research. For example, in Chicago, we had interesting ad hoc conversations with strangers about entrepreneurship, the music industry, and other topics.

**DESIGN WORKSHOPS**
Design workshops usually last between three and four hours and allow the combination of prototyping and interviewing. They allow you to dive into specific subjects with participants as they relate to your product prototype. In Chicago, we conducted one design workshop with three teenagers, who paper-prototyped the Webmaker app with us. This helps gather more realistic data, as participants talk about an actual creation as opposed to a hypothetical one.

**PRODUCT PROTOTYPES AS RESEARCH METHOD**
Using a minimum viable product or various prototypes during interviews has turned out to be one of the most useful methods of user research. It allows you to glean feedback on the product, but also prompt various questions around topics of interest. For example, if there is a "remix" in the prototype, not only can you gain UI and UX feedback, but you can also spark an interesting conversation around remixing in general. The same goes for sharing. For example, a sharing button in the UI can help understand what the participants usually share online, on which platforms, their perception about these platforms, and more. The key is finding a good balance of time to cover all UX and get further information on participants' perspectives.

**WHAT DO WE TALK ABOUT WITH RESEARCH PARTICIPANTS ?**
When conducting these interviews and observations, we covered many topics. Each interview is semi-structured and informal, and we do our best to make them feel like conversations rather than scripted interviews. We know the subjects we want to cover and our objectives by heart, and we leave room for surprises. A good interview is usually possible when we step away from a list of questions and are able to converse about interesting developments.
EXAMPLES OF SUBJECTS COVERED WITH PARTICIPANTS (NON-EXHAUSTIVE)
This list varies enormously according to the participant, and is refined for each interview.

family
neighborhood
passions
friends
hobbies
work
studies
mobile ownership
apps
computer ownership
and activities
social media
online communities
favorite online activities
dreams for the future
dreams for their country and society
fears
activities related to creating
sharing
consuming
remixing
playing and learning
country culture
community culture
perception of other countries
language
favorite music
artists and TV shows
skills
learning environments...
For this project, we curated in-depth conversations with 69 participants. Here are some details about our sample.

**Appendix 3**

**Participant Scope**

**Who did we talk to?**
- Blogger: 11.6%
- Educator: 18.8%
- Parent: 99.4%
- Program manager: 18.8%
- Teenager: 42.6%

**Participants' Age Range**
- 12-18: 27.5%
- 18-25: 27.5%
- 25-35: 27.5%
- 35-45: 27.5%
- 56-65: 27.5%

**Computer Ownership**
- Does not own a computer: 72.5%
- Owns a computer: 27.5%

**OS Distribution**
- Android: 20.3%
- iOS: 7.2%
- na: 7.2%
- None: 20.3%
- Other: 62.3%

**Access to Internet at School or Work**
- No: 7.2%
- Yes: 92.8%
Other Research Reports

- **India**: [mzl.la/india](mzl.la/india)
- **Kenya**: [mzl.la/kenya](mzl.la/kenya)
- **Bangladesh**: [mzl.la/bangladesh](mzl.la/bangladesh)
- **Research Synthesis**: [mzl.la/research](mzl.la/research)
- **Rio’s Lan Houses**: [mzl.la/brazil](mzl.la/brazil)