

FlexSTART — Phase 2

Our flexibility in responding to students has been tested during the time of COVID, pushing interns out of the physical office and online for remote work without the benefit of prior in-office work of the same type. This also impacted development and field testing of these materials as originally envisioned.

TechSTART Internships vary in content and for, building on a core of learning activities within a flexible structure to provide the various learning-by-doing experiences.

This document contains Phase 2 prototypes for:

- Preliminary activities to match interest/ability with opportunity/need
- Prototype PowerPoint welcome to internship — the Challenge
- Onboarding checklist
- AKA Einstein exercise — research & reporting
- Program descriptions:
 - Focus (single sponsor)
 - Exploratory experiences (no single TechSTART sponsor)
- Description of soft-skills training game to be further developed
- Showcase descriptions
- FLeXSTART Phase 3 Development Team

Welcome

FlexSTART launches each quarter with a Friday lunch to welcome our new batch of interns before the term begins. Hosting a live lunch became impossible in the time of COVID. Instead, a short of “getting acquainted” exercises were sent via email format to individual interns:

Email #1: We usually start w a quick activity about “Favorites & Futures.”

- PART 1 — FAVORITES:
List your 3 favorite movies/TV shows
List your 3 favorite games (video, board, sports or contests)
- PART 2 —FUTURES:
Complete the sentence: “In the future, we will...”
Complete the sentence: “In the future, I will...”

Email #2: Rank your top 5 preferred internship topics (updated each term):

- Computer technology —Hardware/Networking
- A+ certification
- Arduino (computer kits)
- Coding
- Web development
- CAD/Architecture
- CAD/Civil Engineering
- 3D printing
- Video production
- Social media/marketing
- Drone aircraft

Email #3: My tech: list your personal/school hardware & software:


- Hardware (laptop computer, desktop, cell phone, gaming device, other)
- Software/apps (Google docs, Microsoft or Adobe programs, web browser, phone apps frequently used)
- Tech classes I have taken/certifications

Answers to these emails help determine best available placement for each intern. How they answer — either live or email — also gives us a sample of their communication skills, either oral or written.

Welcome to the TechSTART Internship Program

Internships offer a pathway to:

- *Job & Career in technology*
- *College and/or certification*
- *Starting a business as a tech entrepreneur*



Internships are a great way to introduce kids to the real work environment.

- In school, you are always told exactly what to do, how to do it, and you're given what you need to do it.
- In real life, you aren't. You're given a general idea of what you need to do, you need to figure out what you need, how to do it, just like I had to do in this internship.

—TSI Intern, Summer 2020

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Learning by Doing

With TechSTART partner

- Coding – Blickel
- CAD/Civil Engineering – 3 Rocks Engineering
- CAD/Architecture – P3 Communities
- Web design/administration – Unbridled

Self-directed with TechSTART support

- 3D printing
- Game design
- Arduino technology



<p>HARD SKILLS</p> <ul style="list-style-type: none"> • Coding • Civil Engineering • Web design • 3D printing • Hydrological study 	<p>SOFT SKILLS</p> <ul style="list-style-type: none"> • Communication • Collaboration • Creativity • Adaptability • Self-management
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Something blocks your way...

- Lack of technical skills
- Lack of experience
- Lack of specific knowledge


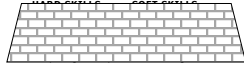
Your body responds...

- Heart starts to pound.
- Breath quickens.
- Pulse races.
- Muscles tense.
- Perceptions narrow but sharpen
- Thoughts focus like a laser

Threat? or Challenge?

Threat > *sympathetic nervous system* enables **fight or flight** response.

Challenge > *parasympathetic nervous system* enables **collaboration and creativity**

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The difference?
How we **think** about it

Cognitive reappraisal can shift a "threat" to a **challenge**

Step 1— **challenge** yourself
Get excited: **"I'M EXCITED!"**

Flip the switch with challenge statements:

- I am eager to tackle this **challenge**.
- I don't mind struggling with this **challenge**.
- Thinking about possible outcomes of this **challenge**.

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TSI — Onboarding Checklist

Interns spend portions of the first week completing basic orientation tasks, both required (tour, safety, conduct expectations). Previously completed informally by the internship coordinator, this form is now given to the intern to complete and file with TechSTART advisor/sponsor.

NAME	Intern	TS	Date
Contact information			
Favorites & Futures			
Interests & Aptitudes			
Door Entry/Security *[NUMBER]#			
Schedule/Attendance			
Conduct			
Dress			
Goals/Reports			
Tour			
Safety			
Commons			
Wifi			

AKA Einstein

*Quick exercise in research and reporting on unfamiliar topics.
Designed as a small group activity, adapted to solo work.*

For this, you spend an equal amount of time researching a topic and explaining it to your peers, via live presentation and/or brief written summary.

PART 1:

One of Einstein's colleagues asked him his telephone number once. Einstein reached for a telephone directory and looked it up. "You don't remember your own number?" the startled man asked. "No," Einstein said. "Why memorize something I can so easily find out?"

Please spend 15-30 minutes researching 2 in-demand tech "hard skills":

- Blockchain
 - Cloud Computing
 - Artificial intelligence
 - UX design
 - Scientific computing
 - Natural Language Processing
 - Data science
 - Podcasting
- (List revised periodically)*

PART 2:

"If you can't explain it simply, you don't understand it well enough."
—Einstein

Present or write a short summary about each topic researched with:

- a screenshot of the original search,
- summary of the topic(s),
- links additional resources (articles, courses, videos)

This exercise can be used to discuss web research techniques, determine communication skills, and establish a knowledge bank. "Deep dive" follow-ups can be assigned as well to explore specific topics of interest.

PROGRAM

TechSTART brings together various tech-related entrepreneurs and small businesses, providing TechSTART interns several placements within existing companies with a specific tech focus, e.g., programming, CAD/civil engineering, web administration. TechSTART also encourages intern exploration of tech-related fields where there no TechSTART partner focuses on that field (e.g., graphic or game design).

FOCUS — interns work with one specific TechSTART Partner (e.g., Blickel) — Not all placements have program descriptions, as these are developed by the intern & sponsor as part of that placement.

The Math Building LLC, doing business as Blickel <i>Gregory Carlson, CEO; Chris Maul part owner</i>	
Job Description	We create websites, and our main site/project is Blickel. Target market is schools and individuals
Business Description	Hard Skills inside the internship: <ul style="list-style-type: none"> • Coding ability • Working in a team • Produce content • code for a website Soft skills expected include: <ol style="list-style-type: none"> 1. Being on time 2. Work Ethic 3. Effort 4. Body language 5. Energy 6. Positive attitude 7. Passion 8. Being coachable 9. Doing extra 10. Being Prepared Team player
Objectives	Interns will learn fundamentals of: <ul style="list-style-type: none"> • website development,

	<ul style="list-style-type: none"> • HTML, • CSS, • Basic JavaScript • Building a Static Webpage • CPanel • PHPmyAdmin • Updating Databases • Day-to-day Blickel tasks • Working in a professional business environment
Preferred Prerequisites	<ul style="list-style-type: none"> • Previous coding experience helpful but not required. • Math: Algebra 1 (minimum) Algebra 2 (preferred— the more math experience, the better) • Positive attitude • Willingness to learn • Team Player (preferred)
Program	<p>Phase 1: Learn HTML</p> <p>Phase 2: Learn CSS</p> <p>Phase 3: Learn cPanel</p> <p>Phase 4: Build a static webpage</p> <p>Phase 5: Learn fundamental JavaScript</p> <p>Phase 6: Assist with Blickel tasks</p>
Showcase	<ul style="list-style-type: none"> • The notes we take • The website we create

3 Rock Engineering

Alex Ewers

Job description	<p>This internship is designed to transform students into productive and hard-working individuals in the workforce who work with integrity, selflessness and ambition. Interns will learn these traits through new and challenging experiences via designated tasks.</p> <p>This internship focuses on the research and development of new technology as well as civil and structural engineering. Interns are typically assigned a project (to take on as a team or</p>
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	<p>individually) based on their interests and skill sets and are then tasked with a series of goals.</p> <p>Current projects include:</p> <ul style="list-style-type: none"> • design of a new type of trailer, • grant application to fund the further development of a patented head gate, • creating cut sheets and 3D printing the head gate, • researching the feasibility of using large 3D printers to model rivers. <p>Interns are often brought in the field to learn more about civil and structural engineering.</p>
Business description	<p>3 Rocks Engineering was started in Cañon City, Colorado, by Alex Ewers to offer the area a local choice for high-quality civil engineering services. Projects focus on custom solutions for our customers, including grading, drainage, utility, and vertical structure design.</p>
Objectives	<p>During this internship students can go through a variety of assignments such as, drafting hydrological innovations, writing/proposing grants to fund future projects, communicating with local businesses, or 3D modeling and printing objects. Students will use 3D printers as well as custom built computers with programs including CAD products, Solidworks, and Cura LulzBot.</p>
Preferred prerequisites	<p>Specific skill sets that are a good fit with this internship are problem solving skills, creativity, baking, and communication.</p> <p>For our interns coming through the school, classes that would greatly assist our interns here would include ADDA, Geometry, Trigonometry, and English.</p>
Program	<p>The program will vary based on the interns assigned/chosen project.</p> <p>Interns will be tasked with a project or design and then research and develop that task until they have made it their own. Once familiar with the assigned task, they plan how the task will be accomplished, executing the plan, and then wrapping up the project or preparing it to be taken on by the next intern.</p>

	Projects could include but are not limited to, structural design, civil engineering, mechanical engineering, or grant proposals. Projects often start with research and
Showcase	Our interns have drafted grant proposals, conducted tests on new patented technology and created new mechanical designs. Through these they have improved their problem-solving skills, gained better money management prowess, and refined their ability to take initiative.

Mammoth Networks

Andrew Eubanks

Job Description	The student will be taken through the learning process of network design as a job, including what it takes to work in this industry, the logic behind the work, the costs of the projects. Students will learn electronics, IP routing and IP scheming. As a task, the student will be taken through area designs and work on making designs of their own.
Business Description	Mammoth networks, founded in 1994 in Gillette, Wyoming, provides for-profit internet-based network service. Target market is bulk purchases.
Objectives	The student will learn what the internet truly is and begin to understand mastering it. The student will also learn the basics to network design and be able to answer the question, "Is network design a good carrer field?"
Preferred Prerequisites	None
Program	The phases of this program will show the student the basics and the teachings of network design and then take the student through case studies.
Showcase	The showcase of the project will be a completed network design by the student that includes cost and any other detail reports.

EXPLORATORY INTERNSHIPS —Interns interested in investigating tech fields with no assigned placement can work with TechSTART to select self-directed learning resources and plan learning projects.

We have offered two categories of exploratory internships, depending upon the individual intern and their interests:

- **Survey** — self-directed research-learning of multiple emerging technology fields in semi-structured weekly exercises exploring: definitions and descriptions, uses in commerce and industry, jobs and qualifications/credentials, learning resources, future interest. Interns may adjust their learning goal as interests sharpen.
Example: one intern examined multiple specific disciplines within the general field of graphic design, discovering an interest primarily in photo compositing.
- **Deep Dive Design** — For fields such as 3D printing and game design, where we have resources but no single TechSTART company sponsor, interns take a 3-phase “deep dive” to learn-by-doing:
Example: 3D printing
 - 1) Print an existing 3D design found on the internet — learn and practice *printing*
 - 2) Create 3D design of interest to the intern & print — *design > print*
 - 3) *Work with a customer* to design & print a requested item

Additionally, as interns explore new fields of technology, they help create a semi-structured curriculum by documenting their personal learning journeys and building upon the prior work of previous interns.

Stages of Program Development/Intern “Authorship”:

- **Explorer** — the first person to broach a subject — little to no structured guidance, little to no employer support or expertise (Cole for 3D, Josiah for drones, Baiza for Arduino)
- **Trailblazers** — 2nd wave of learners follow the Explorer’s “footsteps”
- **Pioneers** —push the knowledge envelope further, including better documentation, expanded customer service/interaction
- **Settlers** — use the previously prepared pathways and documentation to establish permanent learning pathways in new technology fields

This has the added bonus of recognizing Explorers and Trailblazers for their unique if difficult roles in opening up new fields of study.

Quest for Future-Proof Superpowers

A structured set of gameful activities to encourage development of soft skills identified as key to successful employment

Soft Skills

The specific skills are derived from LinkedIn's list of high-demand employability skills.

- Self-Management
- Adaptability
- Communication
- Collaboration
- Creativity

We call these skills *future-proof superpowers* since they remain essentially the same even as technology changes, and help anyone perform difficult tasks. Drawing from IBM's *Workplace Learning Curriculum*, we adapt the program for our smaller audience. IBM holds weekly hour-long classes, using small group activities and discussion. We work with fewer than 5 interns on different schedules, necessitating a different approach.

Gameful elements

The Quest is a self-directed game, like challenging yourself to improve your performance by setting personal goals (run faster) with small rewards (sweet treat). The Quest mimics Jane McGonigal's *SuperBetter* (designed to increase personal resilience), building on similar gameful elements:

Epic Win — Extrapolated from the "Futures" exercise by each intern. This could be a job in a tech company, college scholarship, or launching a start-up. The Epic Win should be *aspirational* — not likely to be attained within the term, but progress can be made towards achieving this goal.

Task — Activity that can be accomplished in 1-4 days related to both the Epic Win and one or more of the soft skills. Examples include setting SMART goals for the internship (self-management), contacting project partners (collaboration & communication).

Bad Guys — Opposing force to overcome. Examples include procrastination, perfectionism, or distractions.

Power-ups — Quick strategies to re-energize you and build resilience anytime needed. Examples include drinking a glass of water, watching funny videos online for 5 minutes, or walking.

Tracking/Scoring — keeping score to make it a game. The Quest suggests tracking on a daily basis with the formula:

$$3 \text{ Power-Ups} + 1 \text{ Bad Guy} + 1 \text{ Quest} = \text{Daily Win}$$

SHOWCASE

Interns should complete their time developing something specific and substantial to display their newly acquired knowledge, skills, and abilities. The showcase piece should serve as an “end of internship” summary that can be shared with others, both in the immediate sense and in the future, as part of a potential portfolio. TechSTART should build up an archive of these showcase pieces to display our interns’ accomplishments.

In the past, we have held Showcase presentations for some (but not all) interns, capturing some (but not all) of them on video. Additionally, interns have built sample web pages, printed usable 3D devices (laptop stand), and recorded presentations about their remote internship experience (learning Arduino technology).

Moving forward, we will formalize the quarterly showcases and develop an archiving system to allow easier access to our interns’ work.

FlexSTART Phase 3 Development Team

To sustain and grow the program stronger, I recommend a loosely structured development team consisting of rotating members from our participating TechSTART partners and student interns. With the established foundation of the student-written P-TECH grant proposal, I believe we will best serve current and future students by employing them to build this program to meet their needs.

FlexSTART Phase 3 —

requires development team or at least “council” — 3 people to help move it forward.

Guiding Principles of Ongoing Program Development

Our unique setting requires maximum flexibility. By remaining **flexible**, we adapt to serve interns in various modes as needed: live, remote, or blended.

2 principles guide development of TechSTART internship opportunities: *emergent design* and “*breadcrumb trails*.”

Emergent Design

Emergent design allows users to define how best to reach their goals. TechSTART partners help guide interns towards selected learning goals.

We rely on a growth mindset to provide maximum flexibility for interns through the foreseeable future, even as technology evolves.

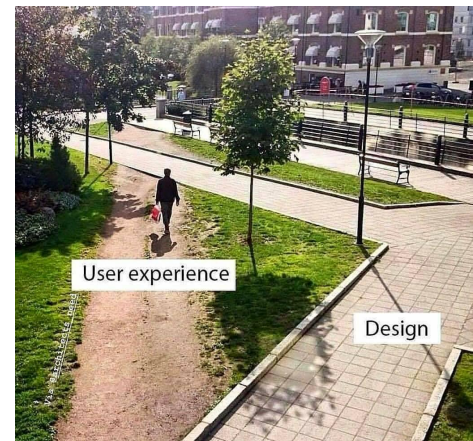
Breadcrumb Trails

Documenting learning to guide future learners

TechSTART partners guide and mentor our interns, but we rely on them to help build our program by leaving “breadcrumb trails” into new topics that other learners can follow.

Examples include:

- Weekly reports listing tasks, tools, and progress
- Databases drawn from AKA Einstein results
- “Hard skills” descriptions LINKS



INITIAL PHONE INTERVIEW OUTLINE

- 1) Age/grade; P-TECH?
- 2) Goals — high school, beyond
- 3) How well did remote learning work for you?
- 4) Schedule — need to average 10 hours/week
- 5) What you **get out of** this depends upon what you **put into** it.