LMS research plan

Conduct user research to assess the usability of GitHub Classroom LMS functionality

Contents

Goals

What do we want to learn?

Evaluate the usability of the proposed LMS UX flow
(outdated; proposed flow is staff-shipped) in Classroom by performing two tasks:

1. Create a new classroom (and integrate with their LMS)
2. Add a roster to the classroom

What are our hypotheses?

Include assumptions that you would like to validate

Methodology

We will conduct usability testing from https://classroom.github.com

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There are various research methods for validating at different stages of product development. A few common methods:

- Usability testing used to better understand how intuitive the team's design is, and how well it fulfills user needs.
- User interviews used to gain deeper empathy by learning more about the user's background, their specific context.
- Tree testing used to evaluate the intuitiveness and organization of content.
- Card sorting used to gain insights from users about how to organize content in an intuitive way.

Resources on research methods:

- https://github.com/18F/methods

Recruiting

Criteria

We're looking to interview 4-6 teachers who teach CS/programming and meet the following criteria:

- Have experience using an LMS (except Blackboard)
- Prior experience with GitHub Classroom not required

Due to the timeframe, we recruited from a GitHub Classroom affiliated community so the participant sample is biased toward those who have prior GitHub Classroom experience.

Invitation email

```
Subject: Invitation to participate in GitHub research

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Thank you for your interest in participating in our
research! Based on your response, we would love to
schedule time to interview you.


Before scheduling the interview, please note that we will
be conducting the session over Zoom and will request you
to share your screen with us during a portion of the
interview. If you don't have Zoom, you will need to
install the application prior to our session. We'd be happy
to help if needed.


If you're comfortable with the above, please schedule a
30-minute session that's convenient for you: https://
www.meetingbird.com/m/ryxmzD1QS


We look forward to hearing from you!
```

Screener

N/A

Consent

Consent form: To come (use Airtable)

Consent responses: Captured in Airtable

Tools

Calendar

Set up meetingbird.com, a calendaring tool, for scheduling sessions

Research candidate tracker

Airtable

Script outline

Prior to the sessions, review Do's and Don'ts with the research team.

User interview

Intros/Warm-up

(3-5 mins.)

[Sample script]

Hi! Thank you so much for volunteering to participate in our research. My name is [name] and I'm a [role or just say researcher] at GitHub. These are my colleagues [names] who are helping with the research.

The purpose of this session is for us to learn more about your experience as [role]. I'll ask you a few questions and, later, I'll have an activity for you where we would need to ask you to share your screen so we can see what you're seeing on your screen. We also need to ask you to talk aloud so we know what's going on in your head as you're thinking.

Your participation is completely voluntary so please don't feel obligated to answer questions that you're not comfortable answering. And please be completely honest with us. You won't hurt our feelings.

We would like to record the session so we can review it later. We will only use this for research purposes and we won't store or share any personal information about you. Do we have your permission to record?

Background and context

(5-8 mins.)

We want to make this somewhat open-ended so we can extract richer data. Probe into their role, responsibilities, and how GitHub fits into that role. Suggested prompts:

- Tell us about your background.
- Dig into their role, their motivations, and responsibilities as a teacher.
    - What are your favorite things about your role?
    - What would you change if you could?
- Tell us about your workflow for managing your class. How do you create and manage lessons?

- Take note of their workflow and what tools they use and why
- Probe into whether they've created hacks or workarounds in order to fill an unmet need.

Usability tasks

(15-18 mins.)

Share the classroom link with them. Ask them to start sharing their screen. https://classroom.github.com/

Let's say you'd like to begin preparing for classes this Fall with a new class. You need to set up your classroom and with your new students. Can you walk us through how you might you do that? https://classroom.github.com/ ?

Wrap-up

That's it! I'm now going to open it up to my colleagues to see if they have any questions. And if you have additional feedback for us, we'd love to hear them.

Would you be interested in participating in a follow-up interview in the future?

Notes

Please take verbatim notes to the extent it's possible. Do not paraphrase or be selective about what you choose to document (with

the exception of omitting PII). The idea here is to capture as much as possible during this precious time we have with our users, and avoid introducing cognitive biases by selecting what to write or not write, or by paraphrasing what was said. See 18F's Research Guide.

Session 1 notes

Recording: https://github.zoom.us/recording/play/ltCuM0wiE9Kr0pJiSOIAV-fJhWC4VkdomkqD6WV4qG7ss8LpEPZncJt3eRZaV0LF?continueMode=true

P: Can you tell us a bit about your background?

K: Bachelors of mathematics in education. Started as a math teacher. Second year taught a CS course. Loves computing and computers. Got a computing ed course in Indiana. Last 5 years, has been teaching math + CS, has been doing CS trainings. Last year transitioned to half time only CS, + working at a startup teaching CS + writing curriculum to kids. Trained in math, but loves CS.

P: What do you love about teaching?

K: Loves hanging out with teenagers. Loves seeing them grow and watching them development. Transition from 1st to 4th year is very rewarding. Watching them gain adult skills. Teaching CS and introducing them to these things can lead to a career and is super relevant to every day life. Even teaching them how to use a computer or phone better has a big impact. Teaching them how to develop apps

and websites is so much fun, creative click “I can make this happen” is so much fun.

P: Want to touch on teaching relevant skills. Do you use any tools as part of your toolkit when you teach?

K: Tech tools?

P: Yes.

K: I use a variety of things. Some of my classes use a CMS. We use Google Classroom to organize everything, student information system called PowerSchool. In the class, we use Trello for project management, likes using GitHub personally, hasn’t introduced to students. Used in one class in the Spring and it was phenomenal. Uses a lot of website for teaching a variety of topics. Google app suite is used every day. Typingclub.com for learning to type.

P: Awesome. You mentioned you use the Google suite as well as google classroom. Is this prescribed?

K: It’s school wide, whole district. Every student has an account. All students 5-12 grade has a chromebook.

P: Lets start talking about, what do you know about GitHub Classroom.

K: I went through campus advisors training. I’ve made a Classroom, made an assignment. Haven’t spent much time outside of advisors training. Mostly just rolling around in the mind, how can I use GitHub in

my 4 classrooms, how does it fit best, do I put everything on Classroom? Wanta to start small, maybe just a couple of assignments.

P: Is it now, the time of the year when you start putting together you plans?

K: Yes, have been busy but doing this stuff in the summer. Next week will be planning classes and semesters.

P: How might you create a new Classroom?

K: Can click the green button or the plus. Then It has to be associated with an org. I made a new org for the fall, this one right here (clicks grant button, types password). So now, <reloads classroom>, I can add to this org. I can give it a name. Now I'm going to have three sections of a single course. **I don't know if it's best to make a classroom for each one or to keep everything on one class** because I will have kids shift hours between semesters. I'll probably end up just making one course for all sections. I'll name it, and then I'll have to do this later <deletes the `-1` from the prepopulated classroom name>, they don't have GitHub accounts yet. Mm, this is amazing. <Sees `Connect to a Learning Management System` screen>I haven't seen this before <Clicks google classroom button, logs into google account>. <Views oauth permissions> Grants permissions. Clicks allow. Ok, so here's all my classes. Haha I have a lot of classes. **I don't know if you're looking for feedback. Some of these classes have been archived. All of these algebra classes are old, it'd be nice to not see them or have them in another section.** Hard to tell how these classes are organized. So lets' pick last years CS1. I'll link it. It's just showing me one permission. <Google displays 1 of 2 permissions serially, showing `View your Google Classroom class rosters` first; Google's modal doesn't allow her to page through the permissions>

Oh, here's the second one. Ok, successfully configured. Can import from google classroom. OK, it just imported everyone, let me see who's in there. <This is sensitive student data> They're in there now… Now I need to link a GitHub Account… I need more guidance here, I assume they need to be part of the org? Then I'll get a link here and I can manually link them? Is there a way when I send the link, Let me see if I can find it again. There was a link to invite people to classroom. There would be good if there was a simple way for people to link themselves to their own persona. It's a little tedious, I have 70 students. Slightly inconvenient. It seems once they're linked, everyone's GitHub account is synced with their Google Persona on Classroom. And then, it's set up. I don't know then what this looks like on the Google Classroom side. Does this give me any functionality within Google Classroom? It probably doesn't. If I create an assignment, there's no special "connect to GitHub feature"? So if I make an assignment, <create assignment> . I would copy this invitation link and put it in my Google Classroom assignment. <pastes invitation link in Google Classroom assignment> When they click this link, it clones the repo into their account. Then they can upload, download, commit, push, whatever. OK, that seems pretty straightforward.

P: Any other feedback?

K: None immediately. I'll have more thoughts once I actually use it a little bit and have a student assignment submitted. And can look at their work. Lets say I link this account to the wrong GitHub account, is there a way to undo?

<d12 offers assistance on how to see the student view>

K: Ohh. They can just pick themselves from the list. That's very easy. <Clones repo> nice. That's the student side, lets upload something random for fun. <uploads a file with gitHub UI> <types commit message>. Ok, back to classroom, assignments, <clicks first assignment>. <Finds herself in unlinked github accounts>. Great I like that. Neat. Wow that's super easy. Can open them up, run the autograder, great. And

P: Getting close to end. Any questions?

K: This is super simple. I can add, remove students, they link their own accounts, I can make assignments and add them to Classroom. The only qualm I have is that I'm a mac user and git works well, but all computers at school are PCs and git doesn't work as well. Web UI works x-platform so that's good.

A way to sort assignments would be great

A way to, in Google Classroom, I can tag assignments with a unit or a topic and then filter by that. It's easy for teacher + students to keep track of this. I'm the only one who sees this side of GitHub Classroom but this will get messy at the end with a lot of Assignments. Sorting/ searching, can I easily delete them? <deletes> Sorting, searching, and grouping would be nice. Doesn't have to have, but it will be beneficial. All functionality of GitHub so that's all great. The power is being able to auto-roster and select from the list, that will save a lot of time on their end and on my end.

Session 1 de-brief

- What surprised you

    - Teachers don’t always understand how to “invite” students. There’s no link, they join on the first assignment.
    - Teacher had completed the advisors training
- What was something new you learned that you didn’t know before
    - Archived Google Classrooms are a thing, they show up in our list on GitHub Classroom.
    - Teacher was delighted when they discovered Google Classroom was one of the integration options
    - Not obvious exactly what the integration does. Nothing on the Google Classroom side (At the moment)
    - Students were all issued Chromebooks (as part of a Google educational program) but the teacher uses a Mac. Has problems with git on Chromebooks.
- What did you find that reinforced what you’ve already known
    - The need to be able to sort assignments
    - Teachers really want autograding.
    -
    -
- Memorable quote(s)
    - Mm, this is amazing. <Clicks google classroom button, logs into google account>. <Views oauth permissions> Grants permissions. Clicks allow. Ok, so here’s all my classes.
    - I don’t know then what this looks like on the Google Classroom side. Does this give me any functionality within Google Classroom?
    -

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Additional notes:

- Simplify the research task to create a classroom and roster

Session 2 notes

Please take verbatim notes to the extent it's possible. Do not paraphrase or be selective about what you choose to document (with the exception of omitting PII). The idea here is to capture as much as possible during this precious time we have with our users, and avoid introducing cognitive biases by selecting what to write or not write, or by paraphrasing what was said. See 18F's Research Guide.

Notes go here. Please don't include any personally identifiable information (PII).

Zoom recording

https://github.zoom.us/recording/share/YaxPcEC93Y4i3g9uj2fT02zrBC1LqU9rARV0Jdwkgil

P: Can you tell us a little bit about your background?

T: my name is paul, I'm a professor at …, I've been teaching here for 3 years, from the Philippines where I taught for 5 yrs. PHD from Japan, post doc from CMU. One of my colleagues was very excited about using GitHub which is how I got introduced. I knew about GitHub but it was when I was teaching which is where I found it very useful. I mainly use it with GitHub Classroom. I'm teaching mostly intro programming courses. 60-120 students. It's tough to share programming questions and collecting back. First time I did this, I used moodle and students uploaded code there. It's very hard to pull the code, compile it, etc, Copy pasting is a pain. GitHub is very useful because , especially integrated with Classroom, I can just download all the answers. Trying to find a way to do automation. My colleague has been trying to use Travis. Trying to Building a repository of problems with unit tests embedded in the problems. Because of unit test setup, we could easily download the code, run unit tests, and use for checking. Trying to find a way to automate checking. With 100 students, it's a huge pain to check manually. We write scripts that run program and output grades to excel. Trying to figure out how to streamline this process. Also evangelizing to other faculty, other faculty don't spend as much time teaching 1st year courses. My research / hidden desire is to make giving questions and checking questions as easy as possible. Encourage more faculty to stay longer and continue with the process. My intersection with Classroom is with it being a tool where I don't have to do everything from scratch. I also interacted with a few different people from industry who use GitHub as a way to understand students programming expertise. The more programs they have on GitHub, the better understanding people have of what students know, how interested they are. One of the things I pitch to students is at the end of the semester, you can fork projects or make public and add to your portfolio. This is more or less what I have been doing with GitHub.

P: Thank you…. Why don't we segway into having you take a look at these beta features what we want your feedback on. Would you mind screen sharing with us? If you hit the green button.

T: As you can see, I have a bunch of classrooms here.

P: Ok, fall is approaching. You're thinking about setting your classroom. And adding your students for this coming fall. So let's pretend you're actually doing that. How might you do that.

T: Ok, so the first thing I would do is set up the organization on GitHub, so that I can go to GitHub Classroom and connect it to the organization.

P: Lets try that.

T: Ok, so do you want me to talk as I do this?

P: Yes.

T: Ok, I would go create an organization first <navigates to GitHub.com>. I have a usual way to do this… what is my pattern? <name pattern> My org name include course number, year, it's fall, section number because sometimes I have multiple sections. And then I would plug in my email. <Create organization> And then I skip add admins. <Fills out survey> And then I'll hit submit, and then based off of what happened in the past, the last thing I do before going to GitHub Classroom, I will apply for the , I forget what you call it, benefits so that I'll have unlimited private repos. I'm looking for that here, here is my organization <on edu web>. I will go ahead and upgrade this. I know I have to wait, sometimes it's 10-20 minutes. For now I will go back to GitHub Classroom. As you can tell, I've done this a few times

P: I'm very impressed

T: Then I can go ahead and create the Classroom. I don't think it's here yet, I remember I need to grant access to the org. I haven't figured out a great way of streamlining this. I use this link on Classroom, I click grant here <types password>, And then I can go back, and I need to refresh… I can click on this and now I have my classroom. And then what I usually do is after I have the more concrete list of students, that's when I will add them to the classroom. <sees LMS page> I have never seen this page, I use a version of Moodle (Titanium), should I click that?

P: Yes

T: This might save me time, I'll try this. <reading instructions> What's worrying me is that my school might have some instructions. I don't know if this will allow me to connect with our LMS. But let's see <reads more> <connect to moodle>. OK, so honestly I haven't tried connecting before. I can try, would you like me to try?

P: Yes please!

<Overlooked instructions link>

T: <Navigates to LMS>. You're not recording PII right?

P: no

T: I don't think I have a classroom yet for next semester… I'll just randomly pick one and see if we can get it to work. Vaguely I know I can add an external tool here… The uni has some preset tools which are already set up, but I assume I can create my own… I don't know how that works… This looks promising… <starts copying keys from Classroom>. I dabble a lot with these things which is why you might see me clicking on everything… I don't know if this will actually work. I'm just going to leave everything to default and hope this works… And I'll click on save changes… OK. It seems to be working… <reading

more LMS config stuff>. OK, And I get a dead page… <GitHub launched in an iframe>

B: it appears your LMS is displaying it in an iframe by default, do you know how to change that?

T: Ah ok, there we go. It took me to my assignments… OK, let me create an assignment, should I do this? I'm just clicking things I see.

P: Ok, lets actually go back and see how we might add students to your Classroom.

T: Ok, um the way it works is that they prepopulate in my class, these are the people already enrolled in my class. Going back to Classroom, roster management… oh there we go! <sees import from moodle> I know this because I've used roster management in the past. It was a bit of a pain using the emails. Clicks import <It appears you're not configured properly>

B: There's a setting in your integration settings which allows you to import roster stuff.

T: I don't know if I have access to that?

B: if you click the gear in your settings page, then you can go to the settings section

T: tries again, gets error again.

B: You may have to relaunch GitHub Classroom from your LMS again.

T: Ok, back to settings, roster management, import. Oh, nice! Ok, set up a roster, what do I want to use to identify. Maybe emails. Import… <brought him back to import screen> Did I do that right?

B: interesting, I haven’t seen this before

T: I was expecting to see student names… Do you want me to try again?

P: yes please, if that's what you'd normally do.

T: It didn’t work the first time, let me try again… Oh there we go! It works with the user ids, I don’t know why it doesn’t work with email. I prefer emails because it’s easier for me to I’d students. Options were name, id email, name would have been great. OK. This is pretty useful, it would take me about 5 steps to get the email addresses to create the roster, this is awesome. How should I proceed?

P: We’re out of time! Maybe we could use the remaining minutes to open for q’s.

T: Ok, questions about the interface?

P: Yes, interface, or anything that feels missing or confusing.

T: The whole process made sense. The main pain point is setting up the stuff with moodle. I’m planning on creating plugin in moodle, but most faculty do not know how to do this. If it’s a step by step guide, it should be straightforward. Brad helped me out and told me to enable this membership thing. If I knew this before, it would have been even more awesome because I wouldn’t have seen that error. Also, if it worked the first time with emails, that would have been nice. The question I have is if I have a student in the roster, how do they connect their GitHub account to this? Does it match by email address on the GitHub account vs email address in the LMS? In the past without the feature, I would have students make sure the email is associated with their email address. What is the next step? What do I ask my students to do now??

P: What would you prefer?

T: A lot of the students, the more steps to explain, the more errors will happen. Some students already have a GitHub account. I need to tell them to add their edu emails. Other students have no account, they need to create an account with their Email. But if there were a way, maybe a wizard, to help, that would be great. In my case I work with freshman, I don't know what the right term is, they have a lot to worry about already. They have no idea what GitHub is. They just know they have an account, they don't know how to use it. Barrage of information. If we could simplify the process a little, it would remove a lot of anxiety. If there was a way to help them through the process without me being the bottleneck, I normally have to answer all questions. A lot of students line up with GitHub questions, I can't answer them all, takes a lot of time. If there was a way for me to focus on high level questions and offload the simple stuff to a guide or wizard, that'd have a huge effect on their learning process.

P: Yes. After all, they want to get to programming!

T: Yes! That's why I'm in this field of work, I want to streamline these processes. Having this feature with GitHub Classroom. This feature is a timesaver for me, I don't have to create this roster anymore, if this gets published.

P: Yes! I'm glad you have exp with these tools, that gives us good context about depth of knowledge. Thank you so much for your valuable feedback. One last thing, would you be interested in future research sessions?

T: Yes! Absolutely!

Session 2 de-brief

- What surprised you
    - Not knowing how to connect roster entries to GitHub account
    - How much domain knowledge they had about Moodle
    - He overlooked the instructions link.
- What was something new you learned that you didn't know before
    - Creating an organization 1-2 weeks in advance before doing anything else
    - Hesitated when he saw the LMS options — wasn't sure about the security implications
    - Deleted the `classroom-1` suffix from the classroom name. Prefers to name the classroom the same as the organization.
- What did you find that reinforced what you've already known
    - We need more actionable errors messages.
    - Went straight to assignment after integrating with Moodle
    - That the hardest step is configuration
- Memorable quote(s)
    - Having this feature with GitHub Classroom, this feature is a timesaver for me, I don't have to create this roster anymore if this gets published. +
    - "I imagine configuring it on Moodle will be the hardest part of the process" +

- “Can I keep using this or will this feature be disabled until it’s released?”
- “This might save me time, I’ll try this. <reading instructions> What's worrying me is that my school might have some instructions. I don’t know if this will allow me to connect with our LMS.”

Additional notes:

Yay 🎉

Session 3 notes

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Zoom recording (will be deleted 30 days from today Aug 2, 2019)
https://github.zoom.us/recording/share/71Pq7UWbEBFgxhxe8PuUYvulYe_CaIFazZDG9sGpKUo

P: Phoebe

S: Steve

P: Love to learn a bit about your background, how you came about teaching?

S: Sure, when undergrad I worked at a tutoring lab, I worked as a grader as well, knew I wanted to teach so I went to grad school and got PHD in comp sci. And so I signed a contract with dept of defense and they gave me a fellowship so I had to work for them for a couple years. Wrote simulation code for army for a couple years. Shutdowns in 2013, they were going to cut pay by 20%, so I looked at private sector and I took a soft eng job at answers.com. I moved to st louis, then worked at a startup for 3 years, I still work for them some times, it's a travel site. But all the while, I wanted to teach. A few years ago I worked for a university and taught C/C++, always something Ive wanted to do, but it doesn't pay like an engineer does. It's like ½ fo ⅓ of what engineers make. It was always a hard sell. But then my son was starting kindergarten, they were having career day, they sould talk about what they want to do when they grow up, I realized I wasn't what I wanted to be when I grew up. So I applied to a couple of teaching jobs, Florida + Vermont. Been teaching for a year now, about to start second year, I love it and since I've been in the industry working with Git/GitHub, (works with these with startup), I've been using the platform for 4 or 5 years now, so I want to bring it into the classroom. I was also in the Navy for 20-21 years.

P: Awesome, I definitely feel for you and I'm ery glad things worked out. Maybe you could tell us, now that you're a year or so in to teaching, tell us about your workflow, how do you manage your class, your lessons?

S: Within GitHub specifically?

P: Whatever toolset.

S: I primarily do read-aheads and then live-codiing in the classroom. We do TDD in the classroom as lectures. I design a program that's going to showcase whatever the topics of the day are and then we work through and talk through the development in class. I do TDD, wjhat do we want to do? Then write tests? Then write functionality. I'm not a purist, I don't typically write _all_ tests. I do that, and I maintain one repo which is the lecture code repository because there's always some people who fall behind or have other difficulties. I have one public repo which is lecture code, + I use GitHub Classroom for distributing work. I have 5-10 labs per semester, + 5 or 6 programming projects per semester. All are distributed via Classroom. I create the project description in a md file locally, then I have a script that pushes that to Git and creates the repo on Git, then I open Classroom in the browser and open that up. I haven't figured out how to do the Classroom part in the command line yet. Then I use Classroom to create assignments. We use Canvas, I just add an assignment link which is a link to the assignment creation thing which clones the repo, duplicates the repo, well you guys are more familiar with that. I say "this is the assignment", it's a link, if it's a programming course I grade with a rubric. I have a grader for about 1 / 2 of semesters, so the rubric makes it not only easier for me but also if we hand off between graders it makes grading more consistent. I was initially doing this in the md file but it makes more sense to use a rubric in Canvas. I do all distribution for assignments in Classroom. I teach 3000 level classes, and 5000 master level classes but pre-master classes, pretty much the same as 3000 level classes, a lot of students have no exp with version control or Git. I tend to spend about ½ of the first class talking about version control and why it will save their life some day. Every lecture I do the three step flow of add, commit, push. In a given lecture I'll normally have a handful of commits and pushes. We have constant git interaction in every single lecture.

P: Great, that was perfect. So we're approaching fall. Around what time of yr do you start putting together lectures and setting up classroom?

S: I'll be setting up classroom the end of next week. Ever since last semester, now we can do Classroom adding automatically instead of having to go through approval process. Before I submitted the process weeks before, because approval took a long time and I didn't want this to be a problem. If I teach git / testing right off the bat, there's less likelihood that we slip into something less desirable.

P: Ok, let's pause here, at this point we'd love for you to test drive the new functionality that we're going to be testing. Would you mind sharing your screen? Let me share this, you're going to have to use your mouse. I'll share the Classroom link. We'll need your GitHub handle.

<Did beta flag stuff>

P: Ok, lets pretend this is next week and you're setting up your new classroom and adding students. How would you do that??

S: Ok, well I haven't created an org yet. <goes to GitHub> <new organization> I forget my naming scheme <for organizations>... <filling out create an org form> Looks like this process has changed slightly… <org name is already taken> Perhaps I already created this org… Let me see. Ah I already did add it! I just haven't given it access. <goes back to Classroom> Soo… <clicks grant access to new org, finds org in list, clicks grant> <reloads Classroom>. There we go. <clicks org> <enters Classroom name> Umm so this is the new part I guess that we're testing? <looking at Canvas> I'm not on my school computer so I can't login to Canvas, I guess that ruins what we want to do here?

P: Well, yes I'd probably click on learn more because I dont know what that means exactly <follows docs link>

S: I actually might skip this feature, mostly because I only use the assignment creation feature.

P: ok, well show us how you might do that.

S: I don't have any repos yet… I only use individual assignments. The only group assignment I do is with an annual hackathon. Each group in the hackathon gets a repo. Otherwise I just do an individual class. For my java class, it's just a .ignore because IDEs add a lot of garbage files, + a md file for instructions. Sometimes a dir with a test file in it. We distribute a full test suite. We give students breadcrumbs, start with test 1, then test 2, etc. I typically include starter code, but I don't have any repos in the Organization. I don't use the deadline feature because I have deadlines in Canvas. I try to only put info in one place because, if school is cancelled and I need to shift the deadline, I have to adjust every place. So I only put info in Canvas. I always use private repos. I don't know, we'll call it lab 1. And then I create the assignment. I copy the link and then I paste that into Canvas. And then for grading, I have a script that clones all the repos into a directory, and does some small amount of pre-processing on things, cleaning things, removing whitespace, etc. Do you need more info? Or is that good?

P: Nope that's good.

S: Did we want to test the integration?

P: Yes. You said you wanted to skip it, why is that?

S: My two concerns are if I'm not aware of our legal counsel signing off on that, I don't connect anything. But also because I use an invitation link, I don't understand what I'd need a roster for. I see risks, but I don't see benefits.

P: Great, that's fantastic. I'll open it up to questions from you, or from any of my colleagues.

S: My question, I'll stop sharing, my question would be I clicked on the read more link to see what the feature is about but I don't want to spend time reading while on this call. So what is this feature about? What's the benefit? My FERPA concern is probably not real but I'd need to talk to the chair. There's not wide acceptance of new technology. A few people try to push new tech, but you don't want to be the person pushing new tech + the person introducing legal concerns. I need to talk with the chair before I do anything like that. What's the selling point?

Nathaniel: <talked about appeal of Roster Management system, but Steve has built this whole system himself locally already :D>

Yeah see I do those things now but I do them myself. I have scripts to do that. The first assignment is just the student's name and their github name and I then have a bash file that just sets up variables so that every time I clone anything, it just renames everything to just the student's name.

Session 3 de-brief

- What surprised you
    - They've established their own personal workflow to accomplish official capabilities
    - The hesitation to log into a LMS -- Data security/concerns
    - They didn't seem to know about the existing roster functionality
    - Start off with creating a new organization first when tasked with creating a new classroom

    - Didn't include deadline because they already include that information in Canvas and they preferred to update that information only in one place.

- What was something new you learned that you didn't know before
    - How much of Classroom processes can be scripted
    - A way to programmatically interact with Classroom
    - He deleted the `-classroom-1` string from the classroom name
    - Wrote a script to automatically connect students' identifiers with their corresponding GitHub username
- What did you find that reinforced what you've already known
    - Explaining purpose/intent could be made clearer
    - Emphasize security practices
    - Will likely begin setting up for the fall class beginning next week (second week of August) when their contract begins.
- Memorable quote(s)
    - "The only time I use a mouse is to go to Classroom"
    - "I see the risk but I don't see the benefit" +
    - "I clicked on the read more link to see what the feature is about but I don't want to spend time reading while on this call. So what is this feature about? What's the benefit? My FERPA concern is probably not real but I'd need to talk to the chair. There's not wide acceptance of new technology. A few people try to push new tech, but you don't want to be the person pushing new tech + the person introducing legal concerns. I need to talk with the chair before I do anything

like that. What's the selling point?"

Additional notes:

- Both professors for testing Canvas/Moodle have said they use scripting to automate as most of the course roster as possible

Session 4 notes

Please take verbatim notes to the extent it's possible. Do not paraphrase or be selective about what you choose to document (with the exception of omitting PII). The idea here is to capture as much as possible during this precious time we have with our users, and avoid introducing cognitive biases by selecting what to write or not write, or by paraphrasing what was said. See 18F's Research Guide.

Notes go here. Please don't include any personally identifiable information (PII).

[User was a no show]

Session 4 de-brief

Participant was a no-show

- What surprised you
    - Text goes here
    - Text goes here
    -
    -

- What was something new you learned that you didn't know before
    - Text goes here
    - Text goes here
    -
    -
- What did you find that reinforced what you've already known
    - Text goes here
    - Text goes here
    -
    -
- Memorable quote(s)
    - Text goes here
    - Text goes here
    -
    -

Additional notes:

Session 5 notes

Please take verbatim notes to the extent it's possible. Do not paraphrase or be selective about what you choose to document (with the exception of omitting PII). The idea here is to capture as much as possible during this precious time we have with our users, and avoid introducing cognitive biases by selecting what to write or not write, or by paraphrasing what was said. See 18F's Research Guide.

Zoom recording (will be deleted 30 days from today Aug 5, 2019)

https://github.zoom.us/recording/share/7RXTzValhjIK6rIPcq85LDAT7K10r7yNAKzixOhXidGwIumekTziMw

P: Phoebe

T: Teacher (Mark)

Hi Mark, Mark can you hear us. Sorry im late uh I was hoping I could install zoom on my laptop in time but apparently not. Woooah thats terrible, tried to do it on my phone. Couldn't do it on my laptop.

P: We'll improvise. I have my colleague Brad here, we were just wondering if we could talk to you about a new feature we're hoping to introduce, althoughh we were hoping we could ask you to share your screen with us, but-

T: I think I may have it installed, but…. Let me see… and then I'll get the link from tne email. Yeah, I work about an hour and a half from here and got home and about 20 minutes ago to get ready. So hopefully we will.

T: I work full time as a professor and teach part time as local teacher at the local community university.

P: First, some legal stuff before we proceed. This is completely voluntary. If we ask you a question feel free to not answer that, but, having said that, feel free to not hold anything back either. Ify ou feel you respond postibviely or negatively, we uh really love to hear what you really think. Also during this, Brad will be taking notes, we will be removing any personable identifiable information. This will be really only for our own team to be helpful for our product to improve classroom. Does that sound okay for you?

T: Yes.

P: We usually like to record but

T: I haven't had this system on for a week… it's now reconnecting. We may now have connection. Let me….

P: No no no thats ok!

T: While im logging in here

P: About a quarter of my calls are like this. People catching the subway or on a scooter.

T: Well I thought I would be walking, but I caught a bus

P: Oh nice

T: I was contemplating, here in Cincinattie, we have scooters, we have lime, we have line, but I just thought I'd take the bus. P: Oh thats awesome.

T: So I'm going to cease and desist this guy [phone]. And then.

P: Ok, see you on the other side then

T: Sorry, perpetual loop there.

P: I still see the ghost in the machine

T: So I should be… P: I think it's working T: Ok good good P: So is it ok if we record this? T: Yeah, that'd be great. P: Thank you so much. T: Has the second one dropped off now? P: No the other one is still there. B: I see the second one has now dropped off. T: Ok good. Sorry about that!

P: Lets continue with this story, you were saying you're a software developer during the day time and teaching part time?

T: Yes

P: So tell me about how you got into teaching? T: U of Tennessee, I got bachelor of informatics. They were retiring, asking if you would be interested in teaching, I said yes absolutely. Didn't expect much to come of it. Then I got an email, and I teach one or two classes a semester. One introduction to CS another intro to database. So that'll be 4 years P: wow that sounds like a fulltime workload for someone with a fulltime job

T: Well it is, but I work with an insurance company based here in Cincinatti. It's pretty big, been around a long time. They love to support Cincinnatti, and love growth, promote colleges and lots of good connections there. Very supportive of it, and when I need to leave because I got something going on, a lecture tonight or something, they're fine with it.

P: What are some of the tools you use to manage those classes? What's your workflow look like?

T: That's a good question, email, Microsoft email, is what the tools uses. I forward it to my gmail. As far as Management Learning System Canvas is what we use. As far as actual workflow, we use Visual Studio. Visual Studio Net is the language. At least in my view, i've worked with Ecliipse, vim, emacs, im old, but as far as my view, Visual Studio is at least the model. Two great advantages: one it's a good tool, two its good for finding a job. But in addition to that, we use visual basic because the school doesn't teach it. They teach C#, but not that. So we think of it as a supplement. A lot of our students wont be software engineers when they graduate, but they will become program managers, we even have some accountants, and they will be working with software engineers, so its advantageous. As well as we teach another language. Did I answer that I kinda rambled.

P: How does GitHub fit into this? T: Well thats a good question. Github ive been using since 2013, Git before that, at the insurance company where i work Subversion is our tool. Let me back up. Historically, older companies, the workhorse, as far as information technology, but still, we have larger system mainframes as our system of records. Millions of records. Now though, we still have the mainframe systems though

distributed. As an ibm company for a few years now, it's been becoming a visual framework. Moving towards using Team Saver and the .net framework, and as you are aware, required by microsoft. Writing is on the wall, so we'll be moving to Git. So I use it personally.

T: And largely I ran into GitHub Education without being aware of it. And thought "OH", because up to then I had been zipping up assignments and have students upload them to Canvas. Why aren't we -- with subversion you when there's conflicts you have side by side layouts -- so I was like this real world and real language they'll encounter in the real world, so that was a no brainer, and one thing led to another, and saw Campus Advisor, now talking with Eric-

P: We're actually approaching the beginning of the school year, what time do you begin putting together classes? T: Well thats a good question because, well, most students, the majority at least, are not going to be developers. And most are like "this is required course" not looking forward to it, but some do! Not all, but a few. We'll do 10 projects during the semester. Thye'll be designing a user interfact, submitting the documents as part of the anlaysis, part of their step by step algorithms. Text by text analysis will take take them step by step even for me i've been doing this for 25 years, when im learning a new language or new framework I like these step by step examples. With all that to say, now that the .NET framework 3.0 is releasing in the fall, Visual Studio isn't used with it, so we use the 2017. So my question is using it into Visual Studio with Git im rambling again

P: No no no! Dont worry. Would you mind sharing your screen and walk us through how you would set up your classroom and add your students? Lets pretend we're getting ready for the beginning of the school year.

T: Let me get signed in here….. Ill share my screen once we get done. How long

P: How large are you classrooms T: Good question, the database course I don't teach that often, but more than oftern its' the one required course. So let me go ahead here.

T: So this is as far as I've gotten setting it up. Haven't gotten my students set up yet. Haven't imported this yet. So I need to get my first initial assignment set up. So I what I said I'll do is…. Do you guys see this?

P: Yes

T: So I don't think i've got a visual studio… well, usually I take them through the command line, and I was hoping I could just go ahead and well- again- is this- am I helping- hurting-

P: So I was looking at your classroom and do you keep your dashboard tidy? It looks vewry tidy T: Yes well typically its only the one course, here's the documents and the compilers I take them through, here's the step by step I usually take them through, now, for example the first chapter the second chapter here's a visual stuidio solution. And here I'd initialize a git repository here locally and do a github copy and do a git file location and upload this commit uh project initial commit P: I don't think I'm seeing the screen T: Ah wait yes I'm not sharing. Lets share my. I thought I was sharing the full view. T: So anyways I was telling you, so for example, if I wanted to, this solution here, let's just, so what I do is come in here and don't know if you see this not or now. Can you see? P: Yes I can T: Lets go ahead and go up lets now list this, what I want to do is grab the solution file as well as my project here. Get in it, so now we got that. Lets go ahead we now see back here in github classroom. Getting a new github repostiroy…. Lets call this, this way… now.. Now I just keep iut public for right now.

T: Now I just drew a blank. To configure the config on it. You know typically, I would just edit this config file directly, but I can't remember what the command line is. I drew a blank, sorry, oh wait, nevermind, im okay. And so I should have this, and I know you're not supposed to have a blank git, but im just doing it anyways. So we have all these nice new files here. Im just like to add my message flag here. And now just simply may fussy about this. Yup yup yup. There we go!

T: So… and again… readme and stuff and this kind of thing. And so! I've got 2 weeks yet. Have to bring in my students. I hope I answered it!

P: So do you create them in this repository?

T: Yes, so I send out this link, but to be honest with you, I'm going to have to review this tool for how it works. But again what I want to do is have this as a tool I'm going to submit this as a question, and when they have a question, do a side by side comparison, any comments in the code? Get their hands in the tool that way! Sorry im 10 minutes over

P: So one of the things you mentioned in the past is that students would send you zip files and send them to canvas and then you would review them, and now you use classroom. So my question is how does that exist with GitHub Classroom?

T: So yeah, I know there's a GitHub add-in to canvas, but im not sure what that will do, so again my hope is, depending on what assignments, for example, when they submit an assignment, they have a link to that repo and they wanna submit questions again or whatever, whatI want have them do, is a guide. Let me just backup here. Here I would have a link. So then they could simply clone my project, with the link from GitHub Classroom. What I would like to do is, what they need to do is, how to clone and teach them, and get them in the place where they can ask questions and be in a place to get started and then push it up as a pull request and then look at it and merge it. I'm thinking out loud and that's my vision! I don't know how that would work but anyway.

P: Are there any pain points between github classroom and canvas?

T: I don't know that. At least as my understanding right now is that they have a link and go into the repo. And they'll go into disparate environments is my understanding. Well one, they want to get their hands in version control. And also, they will be able to see various diffs of various classes. And see hey here's what I did, here's what mark did, as opposed to screen shots, and I use a tool for that called Beyond Compare, and that'll do diffs of text code files. And I think thats a real strenghth of GitHub in general and do those diffs and have a hsitory. And here's my question and my final product with my step by step

history. As a learning tool, they can do see a graph see a visual of everything that's happening. Thats how they can see the real values. Canvas is not going to have that capability. But for this course GitHub Classroom is a -- it's a programming class, you know!

P: So sorry to take you over T: No worries my fault I was hoping to get it set up. PL Maybe in the future, and thank you so much for your feeback. T: Let me know if there's something you'd like to see re any advice and how github classroom is being used. P: Sends great T: You mentioned at the beginning you have a special product but. P: Do you have time? T: Yes im home!

P: Okay 2 or 3 minutes. So if you want to create a new classroom.

T: Having trouble finding it. Ok, looks like we're doing permissions here, new classroom. I don't see.. I'm still me… I'm still not sure what I'm doing here right now.

P: Yes, this is the confusing part, it needs to be associated with an organiztion

T: oh yesesyesyesyes. So do I need to setup an organization. Or do I need to setup an organization? Or is github classrom? P: What do you think?

T: I think generally always good to have your own organization because… well… let me. Let's go back. Let's see… I'm looking how to set up an organization. P: So its actually in gitHub which is just one of the reasons why its confusing. So i'm not sure is, the way I would do it, if you don't mind me coaching you is, if you tab to GitHub.com T: yes okay P: And just that little plus sign at the top….. T: And then new organization? P: Exactly. T: So it wouldn't be a personal one correct? P: Correct. This is very helpful by the way, thank you so much. T: I want the free one I'm sure of that.

T: So now I can invite members correct. I guess I could try to pull the students. Can I put them in without being notified? I'm afraid if I do they'll get notified, and freak out. P: So you already know your students? Kind of, I have a list, very possible they could drop or add.

Typically don't do anything until the first week of class. P: So we can skip this for now T: I can put my own email in here? P: Ok.

P: You have no idea how fascinating it is to watch people do this, thank you very much by the way.

T: Ok, it's probably going to be at least 50 students a semester. Ok Im going to do this just again. Don't worry about time I'm just going to keep goin! So im just gonna change here. There it is. Ok hang on. Get a hold of it somehow……. Hm. what's still as a hold of you. Hm. well what I do is the git folder the git repo and not sure… what's still…. I bet hang on. Well let me go ahead add remote configuration to this guy. There's more than one letter right? Now……. Hmmm yeah so hang on. It still thinks its committed. It still thinks something has ahold of it. Ok, is there a way. Anyway, we're here.

P: So is this basically your workflow?

T: So what I want to do is get my source code committed right here. P: Ok, and you basically just link your students to this repo? Well I would pull all the student emails out of canvas, then add these people to this organization. I would just say I'm still very new as far as classroom is concerned!

P: So thankful! T: Send me anything guys! Any input would be great. Since I'm just starting on using it hahahaha. S: Thank you for letting us follow along. P: have a great day, we went twice as long, I'll follow up with you and thank you so much. I think we could definitely use your feedback since you're so new. T: If you want me to try something with the class I'd be willing to try. P: Thank you! Bye T: Goodbye, thank you!

Session 5 de-brief

- What surprised you

    - Seemed like a first-time user. Even though he had used GitHub Classroom last spring (and had completed the campus advisors program), he was still unfamiliar with basics like creating a classroom and adding a roster.
    - The fact that he might re-use one classroom over and over
    - He might be using GitHub for assignments in general, not Classroom
    - Organization page is where a lot of teachers get lost; needed guidance on creating a new organization.
    - Needed a lot of guidance for Classroom
- What was something new you learned that you didn't know before
    - Teachers might use one classroom over and over
    -
    -
- What did you find that reinforced what you've already known
    - One classroom → One github organization belief/workflow +
    - Onboarding in general (outside of LMS) is still very confusing +
- Memorable quote(s)
    - "I know a GitHub integration already exists for Canvas"
    - "I manually import my students' emails from Canvas"
    - "Well I'm not going to invite them because it's too early in the school year" (about adding students to organization in general)

    - “And largely I ran into GitHub Education without being aware of it. And thought “OH”, because up to then I had been zipping up assignments and have students upload them to Canvas.”

Additional notes:

Does he primarily use GitHub Classroom for his courses? Or just regular GitHub? We don’t know

Analysis

Topline summary

Methodology

- Selected 5 teachers through @ericdrosado GitHub Campus Advisors
- Conducted remote usability sessions
- Approach was a mix of open-ended interviews and usability testing
- User task: create a classroom and add students
- Completed in 5 days—from planning and recruiting to conducting the last interview

Recruiting participants

- Scheduled sessions with 5 teachers who had varying experience levels with GitHub Classroom

- Used an LMS (Google Classroom, Moodle, Canvas)
- Taught high school, college, graduate, and non-traditional
- Class sizes ranged from 30-120 per class; 1-4 classes per semester
- Sample bias

Findings

Validated that roster management between two systems *is* a pain point.

- “The power is being able to auto-roster and select from the list, that will save a lot of time on their end and on my end.”
- **Unfortunately, some of them already solved it on their own**. “Yeah see I do those things now but I do them myself. I have scripts to do that. Their first assignment is just the student’s name and their GitHub name and I then have a bash file that just sets up variables so that every time I clone anything, it just renames everything to just the student’s name.”

Be explicit. Set appropriate expectations.

- **Match expectations with actual capabilities.** Align the capability with their pain point. Don’t request for more permissions than you need.
    - "I don’t know then what this looks like on the Google Classroom side. Does this give me any functionality within Google Classroom? If I create an assignment, there’s no special ‘connect to GitHub feature’?"
- **Provide overt trust signals**.

- "This might save me time, I'll try this. <reading instructions> What's worrying me is that my school might have some instructions. I don't know if this will allow me to connect with our LMS."

- "My two concerns are if I'm not aware of our legal counsel signing off on that, I don't connect anything. But also because I use an invitation link, I don't understand what I'd need a roster for. I see risks, but I don't see benefits … I clicked on the read more link to see what the feature is about but I don't want to spend time reading while on this call. So what is this feature about? What's the benefit? My FERPA concern is probably not real but I'd need to talk to the chair. There's not wide acceptance of new technology. A few people try to push new tech, but you don't want to be the person pushing new tech + the person introducing legal concerns. I need to talk with the chair before I do anything like that. What's the selling point?"

Align with teachers' existing behaviors. Optimize for the common, yet not-so-happy path.

- Consider the teacher's workflow. Teachers we talked to begin setting up their classrooms and assignments this week (the first week of August). They prefer to complete tasks they have full control over and defer tasks that have dependencies outside their control. They tend to defer adding admins and students until later usually because that information isn't available yet or is subject to change.

- Findability for those who may have already set up their classroom, deferred rostering, or re-used an existing classroom. Expose the capability that's available now where and when they need it. Consider re-framing this as an auto-rostering tool that uses LMS integration rather than LMS integration so they can reap the benefits of future features that aren't available now.

First-time user experience is a big issue.

While this is somewhat outside the scope of the LMS study, it's worth noting that we had an opportunity to observe a teacher who was fairly new to GitHub Classroom. A number of the problems we observed are consistent with the findings from an earlier onboarding study.