

# Team XYZ



**TED  
LI**



**COURTNEY  
NOH**



**LOGAN  
SHORT**




**EMMA TOWNLEY-  
SMITH**

# Studio Theme: Creation

Studio Theme: Creation

Our Theme: Creation  
(of educational content)



Learning Process



Learning Process

Creating lessons

Remembering/Recall

Highlighting learning

Teachers + desire to teach

Students + desire to learn

Learning Process



Creating lessons

Remembering/Recall

Highlighting learning

# Our Interviewees: Studying Education



**Jo Boaler**  
Professor of Math  
Education



**Glenn 'Max' McGee**  
Superintendent of  
PAUSD

# Our Interviewees: Practicing Education



**George Fei**  
Student & Splash Teacher



**Petra Dierkes-Thrun**  
Professor of Comparative  
Literature

**Jennifer Short**  
Middle School Chinese Teacher



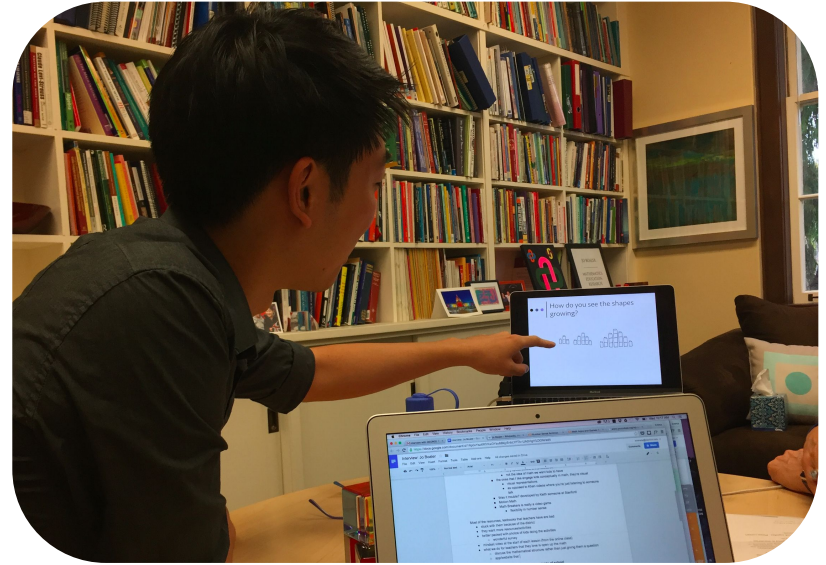
## Jo Boaler

Professor of Math Education

“ [For teachers], the problem isn't that the resources aren't there... **it's hard to sift through and find quality work.**”

We want to **open up** the learning process, and let the students learn for themselves.”

... a lot of ed-tech has tried to **go around teachers**, like Khan Academy.”



**Ted tries one of Boaler's 'opening math' exercises: visualizing  $(n+1)^2$  growth.**

# Jennifer Short

## Middle School Chinese Teacher

“

"Teachers just don't have enough **time**."

"A lot of teachers have great ideas for activities to reinforce learning, but **finding the time and resources to make them a reality just isn't possible** while teaching."



"Games help, but sometimes they're so boring, but **I can't do anything** about them."

## Petra Dierkes-Thrun

Professor of Comparative Literature

“ there’s this guy at the law school who teaches abstract concepts in law by bringing in visual materials (photographs, and sculptures, etc)... **giving teachers a repository of other ways of describing something really complex** or illustrating it”

[For teachers] there’s a **sharing economy** going on behind the scenes. I look at their stuff and realize it’s too specific for my needs... but it actually helps me **BRAINSTORM THINGS!**”

## Max McGee

Superintendent of PAUSD

“ ...the important piece is allowing time for that **conversation**, and organizational space for that.”

...students have to generate a work product that ideally **generates new knowledge**.



...[teachers] brought with them knowledge and network much **beyond the high school community.**”

# George Fei

Student and Splash teacher

“

Learning python: “It’s very difficult to understand what’s important and what’s not -- very difficult to **distinguish the fundamentals from the details.**”

“When writing my notes, I create a **spatial relationship!**... literally doing SOMETHING that makes you interact with it to a certain degree.

# SAY

"It's very difficult to understand what's important and what's not - very difficult to distinguish the fundamentals from the details."

"I started using [Duolingo], and I thought it was amazing. But after a while, I realized it was a lot of work and I got tired of practicing."

"Cooking started more as an obsession of curiosity. It was very broad, specific. I want to learn on my own! I realized cooking wasn't about specific dishes but was about a wide variety of skills and knowing when to stop cook!"

"When teaching others informally, then I'll be like, this is how I understood it, and I realize that they're missing some fundamental concept, then I'll backtrack and make sure they understand the material concept and then build up. I usually turn them into big lessons, like 'this problem demonstrates the concept! don't just memorize the method!'"

"...better an atmosphere of cooperation and get neighbors to speak to each other! I feel like it's really important to have that dialogue - get the neighbors to speak to each other..."

"I think being able to do something with the information allows you to remember it a lot better. Like write it down again on notecards, make drawings. Literally using SOMETHING that makes you interact with it to a certain degree."

"... a lot of ed tech has tried to go around teachers, like Khan Academy?"

"the problem isn't that the resources aren't there, it's that the outreach and find quality work."

"Most of the resources, the textbooks that teachers have are just... bad"

"Even when they're making resources for each other, most teachers don't know the research"

"When learning Python, I found out that, IDEs are different for each language and I didn't quite understand that concept..."

"I want to learn how to create mini-games, but the problem is that takes lots of resources! Other than that, coding can be really useful if you buy that one thing and use it only once..."

"Wouldn't you use actions and demonstrations?"

"The textbook was helpful for me to ground the thoughts in concrete terms, because it's a very good starting point"

"I think it's a lot more enjoyable, because you can kinda force it into a dialogue... forcing it into a dialogue makes it a lot easier because they have to synthesize while you're going and spit it back out!"

"I would love to tutor others, but... I was really busy one quarter, and I'd by the next quarter, but they have preference for people who started the first quarter, so I wasn't able to do it then."

"I think it's always a good step to start memorizing facts, because then you have a small scale appreciation for what's going on. It gives you a little bit of a head start, and you have some probability of the system, but once you start incorporating concepts, then you should start learning the principles behind those rules."

"When we play Jeopardy, I wish we could have a buzzer thing connecting the computer. Do you know how to do that?"

"Teachers just don't have enough time"

"A lot of teachers have great ideas for activities to reinforce learning, but finding the time and resources to make them is really just not possible while teaching"

"Often we were limited in our ability to demonstrate things, so videos are good for that."

"When you're trying to teach a concept, it becomes difficult to communicate that concept to someone... but I feel like the process of explaining those thoughts is really important"

"we found it necessary to use real life examples - for instance, it's a lot more convincing if you describe an opponent's action in a lot of terms instead of just telling them, because they have something to remember by."

"[Asked rhetorically to himself] 'What do people usually start off with?'"

"The tricky thing about this is that the fundamental concepts to me or to you are very different to someone just starting out and have never had a chem class."

"try to find some way to incorporate it into my everyday life"

"when writing my notes, I create a spatial relationship and it helps the remembering things much better - places ideas in a very solid context."

"Based it off various other curricula we found online"

"[most effective teaching style was] asking conceptual questions... and even when we get stuck, she would NEVER give us the answer and she would sit there, forcing us to say something, even wrong answers, and encouraging to think about why answers were wrong - we had to give her the answer!"

"The idea is they have to generate a work product that ideally generates new knowledge... write and present a formal proposal for their research. Literature review... budget..."

"they have to generate a work product that ideally generates new knowledge"

"It really produced a community of learners and a community of teaching and learning that not only enabled the kids to excel academically... but self-confidence, collaboration, resilience, adaptability... coping with ambiguity... frankly, conducive to a life-long learning."

"I have about 20% of the material I already teach and already know and have taught before - it takes to be 50% of the material I have enough time in the quarter to teach up on the new stuff."

"content creation is not only about learning goals and content but also with practicality"

"pedagogical considerations"

"I actually use social media a lot to reach out to other teachers and if they've taught it before and if they mind sharing syllabi, etc. that's a sharing economy going on behind the scenes concerning teaching."

"a lot of times, I look at [other people's teaching material] and realize it's not specific for my needs... but it actually makes me BRAINSTORM THINGS!"

"[what makes a student successful is where] they would go and intensely read and make their connections themselves - they would be weaving this web and making these connections and building on that"

"...this guy at the law school who teaches abstract concepts in law by bringing in visual materials (photographs, and sculptures, etc.)"

"...creativity from many different angles, analogies, giving teachers a repository of other ways of describing something really complex or illustrating it..."

# THINK

Separating out fundamental knowledge from mere details is essential when learning new skills.

Too many barriers for people who want to teach others.

Learning certain things, like new languages, become much easier with some means of integrating it into daily life and usage.

It's unfortunate that so many resources are going AROUND teachers instead of being funneled into teachers.

The resources offline are equally ineffective, and we need some way to change both of these... We need open learning.

A limitation for learning can be limited resources (wasting) or the fear of wasting the resources.

Understanding what others use to explain concepts, use for examples, or organize new curriculum is helpful.

Creating deep conceptual understanding of material stems from being able to understand fundamental concepts and create connections between them.

Education of teachers in educating students is an equally important task. Time is a huge limiting resource.

More intuitive design and technical support, as well as applications directed at making learning activities accessible to teachers.

Real life examples (and videos, if lacking resources) are essential resources for effective teachers.

Spatial relationships and interacting with material (whether it be through dialogue with others or with outlines) are helpful for retaining new information.

We want to help students think deeply and make connections; these are integral for students to learn.

It's important for students to be involved in creating knowledge, not just memorizing/ learning what others have created

We can't just use materials from online. It would be great to have tools that would help us more easily make teaching materials/games

Time is a huge limitation.

Teachers also want to continue learning, but we have to be realistic with how much we can realistically learn (for teaching new material), while continuing to teach.

Other people's material can be very helpful to use as inspiration. Teachers freely share with one another, but through an unstructured, informal way - social media.

Different perspectives and angles are helpful not only for the teacher (in presenting the material), but also the student (in learning).

Learning as a core value affects not only knowledge, but self-confidence and ability to work with others

# DO

Gestureed often

Thoughtful pauses

Long tangents about chemistry

Enthusiastic about teaching chemistry

Showed us how he searched for news

Pointed out the flaws in some textbooks that teachers are required to use

Showed us a computer program that goes along with the Chinese textbook (that you can listen to) Tangents about current teaching material

Showed us an app that her students told her was good

Walked us through an exercise to visualize (n+1)\*2 growth

Showed us some of the math games she liked on youcubed.org

Showed us specific likes/dislikes about the program + textbook

Showed us positive twitter reception about youcubed.org

Heavy sighs

Touching his face when he talked about the school that he founded that eventually grew away from his ideal project based learning vision

# FEEL

Hopeful Overwhelmed Curious Excited Humorous Helpless Anxious Philosophical Upset Pedagogical Reflective Passionate Creative Motivated Social Busy Frustrated Innovative Annoyed Frustration Benevolent Driven Entrepreneurial Thoughtful Inspired Concerned

# DO

- Gestured often
- Thoughtful pauses
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- Showed us some of the math games she liked on youcubed.org
- Touching his face when he talked about the school that he founded that eventually grew away from his ideal project based learning vision

# FEEL



**Tension:** teachers feeling excited and frustrated about trying new things because of the lack of quality control.

# SAY

understand that's not the details."

"When learning Python, I found out that IDEs are different for each language, and I didn't quite understand that concept..."

I thought I was the only one who had a session of it until I wasn't about a wide variety of roles!"

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"would try to use actions and demonstrations"

"the textbook was helpful for me to ground the thoughts in concrete terms, because it's a very good starting point"

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"I would love to tutor others, but... I was really busy one quarter, and I'd try the next quarter, but they have preference for people who started the first quarter, so I wasn't able to do it then."

"based off various other curricula we found online!"

I think it's always a good step to start memorizing facts, because then you have a small scale appreciation for what's going on... it gives you some comfort too, so you have some predictability of the system... but once you start incorporating exceptions, then you should start learning the principles behind these rules.

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"Often we were limited in our ability to demonstrate things, so videos are good for that."

"The problem was troubleshooting experimental parts [for education]"

we found it necessary to use real life examples -- for instance, it's a lot more convincing if you dissolve an eggshell with acid in front of them instead of just telling them, because they have something to remember it by.

"(Asked rhetorically to himself) "What do people usually start off with?"

The tricky thing about this is that the fundamental concepts to me or to you are very different to someone just starting out and have never had a chem class.

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pedagogical considerations!

i actually use social media a lot to reach out to other teachers and if they've taught it before and if they mind sharing syllabi, etc. there's a sharing economy going on behind the scenes sometimes.

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Learn affect know confi work

**Contradiction:** Teachers think that students learn best when they make connections for themselves... but the student approach is often going to textbooks, etc.



# SAY

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"The problem was troubleshooting experimental parts [for education]"

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**Surprise:** The creation of good educational content has more to do with tailoring for your circumstances than 'reinventing the wheel'

# Inferences & Conclusions

Teachers' access to creative resources and a peer community affects how **empowered** they feel to make change in the classroom.

Teachers' creative process isn't independent -- it's frequently reliant on **inspiration from peers** and **tailoring + curating existing content** for new practical circumstances.

# Inferences & Conclusions

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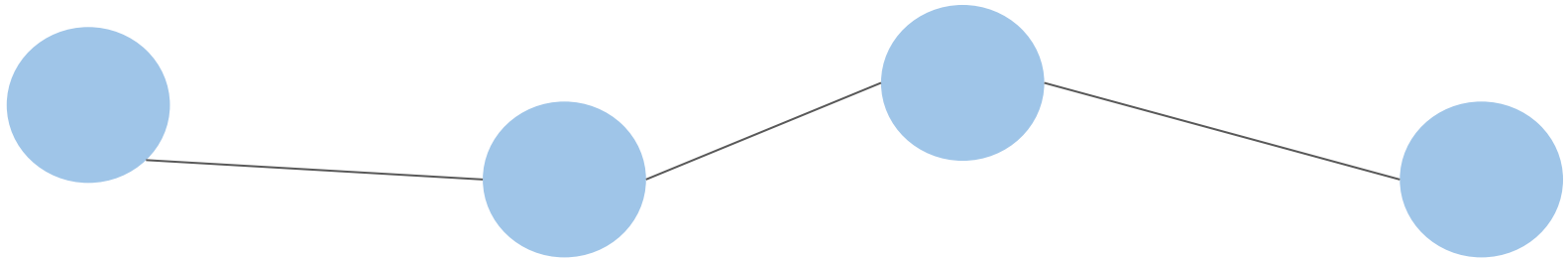
# Inferences & Conclusions

Students' learning struggles seem to center around relationships between abstract concepts.

How important are concepts relative to each other?

How are certain concepts related?

How do these concepts apply?



# Inferences & Conclusions

FOR TEACHERS

NEED

INSIGHT

FOR STUDENTS

NEED

INSIGHT

# Inferences & Conclusions

## FOR TEACHERS

Feel empowered through  
access to creative peer  
feedback and resources

**INSIGHT**

## FOR STUDENTS

**NEED**

**INSIGHT**

# Inferences & Conclusions

## FOR TEACHERS

Feel empowered through access to creative peer feedback and resources

**'Creating'** is about tweaking, modifying, personalizing

## FOR STUDENTS

NEED

INSIGHT

# Inferences & Conclusions

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# Inferences & Conclusions

## FOR TEACHERS

Feel empowered through access to creative peer feedback and resources

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## FOR STUDENTS

Feel confident in understanding relationships between new, abstract concepts

**INSIGHT**

# Inferences & Conclusions

## FOR TEACHERS

Feel empowered through access to creative peer feedback and resources

**'Creating'** is about tweaking, modifying, personalizing

## FOR STUDENTS

Feel confident in understanding relationships between new, abstract concepts

**Organization of material** is where teachers are needed most

# In summary...

We've identified two 'creation' moments that we're excited to explore:

- 1) Teachers creating visual or hands-on activities to accompany their lessons
- 2) Students creating visuals in order to interact with abstract concepts