Tokyo Tech's Graduate Student Teaching Assistant (GSA) Developer Program

January 26, 2023

CITL Symposium

Jeffrey S. Cross and May Kristine Carlon
Center for Innovative Teaching and Learning (CITL), School of Environment and Society, Tokyo Institute of Technology, Tokyo

Outline

- Background
- Online course development
- TA training via OJT
- Activities
- Achievements
- May’s talk - activities and skills

OCRD : Online Content Research & Developmemt

136,000人 がTokyoTechXで開講した オンライン講座を受講しました。

204カ国・地域 からTokyoTechXのオンライン 講座に受講者が集まりました。

170人のTAs が、OCRD教職員と ともに講座開発に関わりました。

オンライン教育部門とは？

東京工業大学 教育革新センター オンライン教育部門(OCRD)では、MOOC*を通じて東京工業大学の研究・教育を世界に配信しています。教職員と学生の協働でオンライン授業を開発し、MOOC配信プラットフォーム edX より、TokyoTechXとしてオンライン講座を提供しています。

＊MOOC (Massive Open Online Course：大規模公開オンライン講座) とは、インターネット環境があれば誰でも無償で受講することができるオンライン講座です。

開講中のMOOC

- Autophagy : Research Behind the 2016 Nobel Prize in Physiology or Medicine
- Introduction to Business Architecture
- Basic Japanese Civil Law
- プログラミングしながら学ぶコンピューターサイエンス入門 : Introduction to Computer Science and Programming
- Introduction to Deep Earth Science
- Introduction to Electrical and Electronic Engineering - 電気電子工学入門 -
- Modern Japanese Architecture
- Monozukuri
- 科学技術・AI倫理 Science, Engineering, AI & Data Ethics
- Introduction to Computer Science and Programming
- Japanese Architecture and Structural Design
- 将棋で学ぶプログラミング基礎
- 超スマート社会への招待

OCRDが提供する各種支援

- MOOC教材設計・教材の英語化
- MOOC/SPOC 講義映像の撮影・編集
- MOOC/SPOC サイト構築
- MOOC開講時の受講者対応
- 教職員・学生向けの映像教材制作研修

撮影は学内スタジオのほか 教室や研究室など出張撮影も可能です。

オンライン講座の受講はこちら

HP www.edx.org/school/tokyotechx

TokyoTechX edX

※edXのアカウントを作成し、お好きな講座を受講登録してください。受講料はかかりません。

講座開発に興味がある方はこちら

HP www.oedo.citl.titech.ac.jp

oedo@citl.titech.ac.jp

03-5734-3445

Office Background

- »Tokyo Tech Online Course Dev. Office (OEDO) founded in 2014 – joined edX
- »Mission: Online course development (edX+
- »Train TAs to make online courses, R&D…
- »TAs made conferences talks
- »Organize video workshops
- »Virtual Exch. MOOC – HKUST
- »2022 OEDO changed to Online Course Research and Development (OCRD)
- »Video studios for media production

Open edX Conf. 2016
Stanford Univ.

UBC
Dr. I. Roll

Japan edX Partners

OCRD Staff, TA & MOOC making model

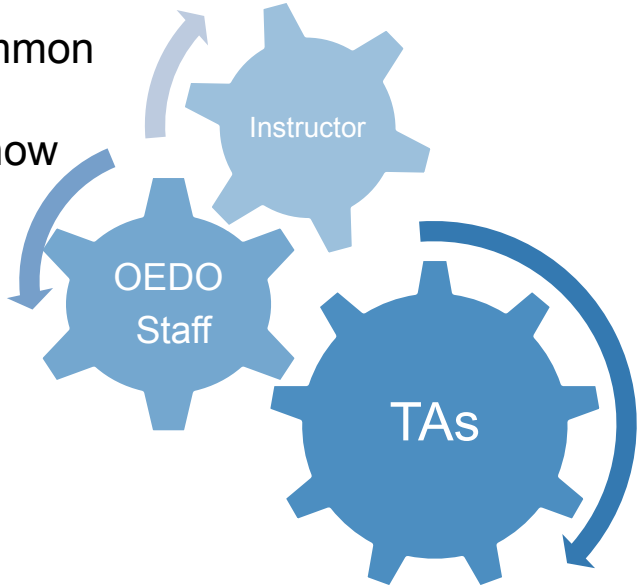
Staff: General Manager (JSC), Y. Yamashita, May Carlon, Video Tech, Staff

In Japan univ. teaching assistants (TAs) not common

How to develop online courses with little know-how and minimum human resources in 2014?

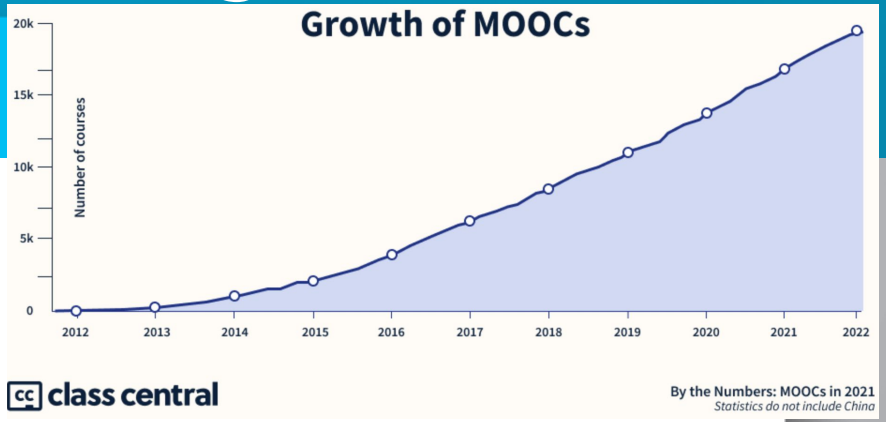
Train TAs (Jpn/Intern.) to co-develop MOOCs (B4,M,D)

"*MOOCzukuri* = Hito*zukuri* (人つくり)
「教育は人づくり」



Online learning – rapid change since 2012

Massive Open Online Course (MOOC) – public which are free or charge fee (certificate)
Small Private Online Course (SPOC) – campus courses



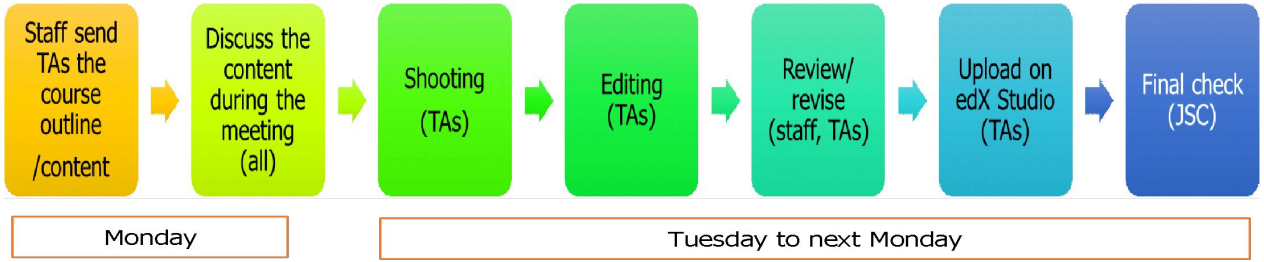
- **Learning management system (LMS) – open edX , Content Management System (CMS) – edX studio**
- **Online credentials, professional education (continuing edu), Micro-master, degrees, MOOCs for credit – not free**
- **Providers: JMOOC, edX, Coursera, Udacity, JV-Campus …**
- **Learners: worldwide 220+ Million (various ages), 20k courses**

Online course dev. Teaching Asst.

Activities (On the job training)

- Video shooting/editing
- Contents dev. (text, quiz)
- Graphic design (slides, SNS)
- Social Media/marketing/PR
- OpenedX LMS course authoring
- Learning Analytics
- Skills Workshop

Weekly cycle During MOOC Development



TA training courses & activities

Course Content Creation

- Campus course: "Introduction to EdTech: Online Courses" use open edX
- Workshop by International scholars (UBC, Stanford, Caltech)
- Workshop with Japan edX Partners (Tokyo, Kyoto, Osaka, Waseda)
- Learn by training then doing – creating an online course

Educational Video Production (Story-telling)

- Campus course: "Introduction to EdTech: Video Production"
- Online and on-campus video production and editing workshops

Graduate Student Assistant - Developer

- After TA works for 90 hours, student writes a report on work and plan for future
- Report approved by Prof. student receives a certificate
- GSA-Ders serve as leaders in course development
- Two GSA-Ds worked in CITL and also were co-instructors in campus courses
- 43 students received GSA-D certificates

Graduate Student Assistant – Report

OCRD Graduate Student Assistant Developer (GSA-D) Certificate Application Form. Please complete the form by the deadline as indicated in the accompanying email and return to Ms. Murai. 90 hours of OCRD TA work experience is required and your application will be evaluated by OCRD/CITL GSA committee. TAs that receive the certificate are eligible to receive a TA salary increase after approval.

Name: Student NO: Total hours(OCRD TA 100

Please fill in the table below about your past work TA work experience in OCRD. Please summarize your OCRD work activity in the table below. Edit as needed.

Year & Quarter	Task (editing shooting, content, beta-tester…)	Total Hours (hr)	% time spent on task
2021, 3Q	Discussion Board Analytics		
2021, 4Q	Discussion Board Analytics		
2022 1Q	Discussion Board Analytics		
2022 2Q	Discussion Board Analytics		

Write a paragraph on what you have learned about online course development, marketing, discussion board, content development, video shooting/editing, communications, project management… based upon working in OCRD as a TA. Finally, what skill would like to learn in the future in OCRD as a TA?

I learned about hands on application of Natural Language Processing models. I used them to analyze sentiment of posts made by teaching assistants. These pretrained models were not able to capture differences in sentiments. As a result, we used other features of sentiments – valence, dominance and arousal to capture the differences. Further analysis of post length was done for TA's with high number of votes. In future I would like to work as TA for Computer Science course and help students with finer details of the language.

DRAFT written by Student

Online Content R & D (OCRD)

OCRD Graduate Student Assistant Developer (GSA-D) Certificate Application Form. Please complete the form by the deadline as indicated in the accompanying email and return to Ms. Murai. 90 hours of OCRD TA work experience is required and your application will be evaluated by OCRD/CITL GSA committee. TAs that receive the certificate are eligible to receive a TA salary increase after approval.

Name: Student NO: Total hours(OCRD TA): 100

Please fill in the table below about your past work TA work experience in OCRD. Please summarize your OCRD work activity in the table below. Edit as needed.

Year & Quarter	Task (editing shooting, content, beta-tester…)	Total Hours (hr)	% time spent on task
2021, 4Q	Discussion Board Analytics – Research paper/Idea formation	22：45	14%
2022 1Q	Discussion Board Sentiment Analysis: Pretrained model	64：00	42%
2022 2Q	Discussion Board Analytics – Research paper/Idea formation	28：00	19%
2022 3Q	Discussion Board Sentiment Analysis: Vader Lexicon	37：00	25%

Revised after comments from Prof.

Write a paragraph on what you have learned about online course development, marketing, discussion board, content development, video shooting/editing, communications, project management… based upon working in OCRD as a TA. Finally, what skill would like to learn in the future in OCRD as a TA?

Past researches have shown that 50% of online course students who pass are active on discussion board (DB). Also, they have higher than average scores. This shows that engagement on DB is important task in online courses and TAs play a crucial role in it. Also, researches have shown that emotional engagement becomes even more important when teaching is done in technology rich environment. In order to measure emotional engagement offered by TAs, we used Natural Language Processing (NLP) models for sentiment analysis of online course DB posts. Pretrained NLP models were only able to classify emotions of posts as 90% (or above) positive or negative, which was ineffective for capturing quantifiable differences in sentiments of posts by learners. As a result, we used other features of sentiments – valence, dominance and arousal to capture the differences in sentiments. Within a course, higher valence score was observed for TAs with high votes where post length was comparable (1 sentence gap – 13 words). Other courses had posts length varying from 3 sentences to few paragraphs (20 sentences), with valence scores increasing with length (nonlinear). This was observed for both – courses with and without discussion prompts. Our analysis shows that TAs should be advised on length of posts to be made on DB. Reference can be taken from TAs with high number of votes with 4 sentences posts on average.
In future I would like to work as TA for Computer Science course and help students with finer details of the language.

What do TAs learn from online dev. ?

- edX Autophagy MOOC created in 4 months (3 segments)
- Slack workspace: 5,371 messages, 18 TAs/14 posting weekly
- Group work dynamics
- Time & project management (Japan style)
- Online course creation
- Skills: communication, video-editing, course curriculum development, story-boarding, LMS, project management, edtech, assessments, discussion board interactions, file sharing, social media marketing, graphics, …
- Great training program for doctoral students - future faculty
- Japanese students learn and improve English ability

GSA Certificate – OJT and coursework

Where are GSA-D now? Tokyo Tech, UTokyo, international TAs returned home, some work at private companies in Japan and overseas etc.

Summary

- In 7 years, trained 170 TAs (1/4 Japanese, International students)
- 3 former TAs worked in CITL, few at Tokyo Tech, UTokyo, Companies
- Course development – great OJT to dev. Future faculty
- Former TA said: Working in OCRD described it as *“Learn and Earn”*
- Developing TAs skills time consuming & requires staff supervision
- OJT – *Hitozukuri* with TA approach fits Tokyo Tech education
- Online courses started in 2014, well positioned when COVID started
- Ref.: Wrote a book chapter on learning analytics assess of MOOC content

論説 Editorial

Journal of Japan Society of Engineering Education 2016

Challenges and International Opportunities with STEM based MOOC Development

Jeffrey S. Cross※1

Massive Open Online Courses (MOOCs) provide both opportunities for world-wide student engagement and learning but also challenges for institutions that are developing them. In this paper, I address these various issues relating to MOOCs based upon two years of experience in developing them on the edX platform at Tokyo Tech. In particular, I discuss the Tokyo Tech Online Education Development Office's MOOC teaching assistant (TA) based development model and internationalization activities.

論 文 Paper

Tokyo Tech Graduate Student Teaching Assistant Online Course Development Program

Jeffrey S. Cross ※1, 2 Toru NAGAHAMA ※2
Masao MUROTA ※3 Saya GOTO ※2

Tokyo Tech faculty members and staff began developing online courses hosted on the edX website in 2014, by working with student teaching assistants (TAs). In 2016, Tokyo Tech received a grant from Japan's Ministry of Education (MEXT) to establish a Graduate Student Assistant (GSA) educational training program using both coursework taught for credit and on-the-job training (OJT) to development students' online course-making knowledge and skills. Furthermore, GSAs were actively involved in assisting instructors in teaching undergraduate courses in the classroom and online forming a "learning community" with students, peers, instructors and staff. GSA online course development skills and learning analytic skills were also sharpened by holding workshops on campus with experts. In the Coronavirus era, where education has shifted to online content delivery exclusively, training GSA to create online courses is a practical way to support faculty, develop new online courses for the general public (outreach) as well as to train doctoral students who will become future academic faculty.

Best Paper Award IEEE Learning with MOOCs 2019

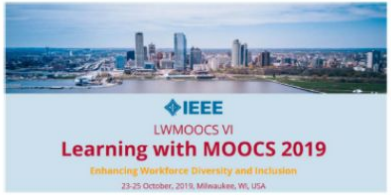
IEEE LWMOOCS 2019
Milwaukee, WI, USA, October 23rd - 25th, 2019
AWARD CERTIFICATE

This is to certify that

Jeffrey S. Cross, Nopphon Keerativoranan, May Kristine Jonson Carlon, Yong Hong Tan, Zarina Rakhimberdina, Hideki Mori

have obtained the Award
Best Paper Award
for presenting the paper
Improving MOOC quality using learning analytics tools
presented by **Jeffrey S. Cross** during the conference IEEE LWMOOCS 2019

Milwaukee, 25th of October, 2019



Russ Meier (General Chair)
Jim Sluss, Edmundo Tovar and Manuel Castro (Program co-Chairs)

IEEE Education Society

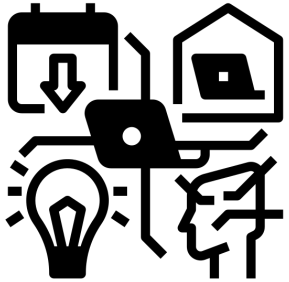
IEEE

http://lwmoocs-conference.org//

I’m May from the Philippines, now living in Tokyo

- ★ Online Education Development Office ⇨ Online Content Research and Development
  - Teaching Assistant, Oct 2018 ~ Sept 2021
  - GSA-D, Oct 2020
  - Educational Specialist, Oct 2022 ~
- ★ Ph.D., Tokyo Institute of Technology, Sept 2021
  - MS CS, Georgia Institute of Technology, Dec 2017
  - BS Math, University of the Philippines, Apr 2006
- ★ Part-time Lecturer
  - Hosei University, April 2022 ~
- ★ Software QA Engineer
  - Philippines, May 2006 ~ June 2014
- ★ Software Engineer
  - Japan, February 2015 ~

Expectations and thoughts on the future



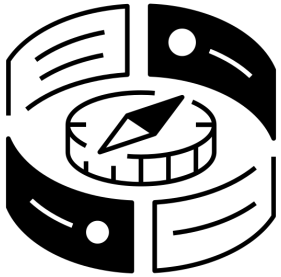
Future of Work

OECD says...

- Digitalization
- Lifelong learning
- Social protection
- Job quality

"Old" model

- Live or on-demand
- Onsite or remote



Distributed Experience

"New" model

- Hybrid
- HyFlex

Pedagogy

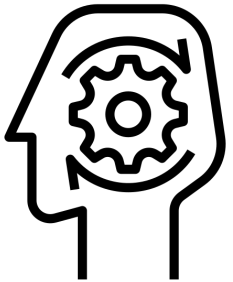
- Scaffolded learning
- Basic and higher education

Andragogy

- Experiential learning
- Corporate training

Heutagogy

- **Self-directed learning**
- **Lifelong learning**



Skills developed from my Ph.D. program

Research

Academic Writing

Public Speaking

INVESTIGATING MECHANICAL ENGINEERING LEARNERS' SATISFACTION WITH A REVISED MONOZUKURI MOOC

Online Education Development Office
Center for Innovative Teaching and Learning

EMOOCS 2021
May Kristine Jonson Carlon, Mohamed Rami Gaddem, César Augusto Hernández Reyes, Toru Nagahama, Jeffrey S. Cross

Feedback

I truly enjoyed the videos, all of them. Amazing valuable interviews. Very happy with the broad information material provided on philosophy, learning styles, information on Tokyotech [sic] students club and the pop-pop boat. Every bit is so valuable. It did make me think a lot, very excited with the course and shared what I learned with my family. Re-reading and watching all. Monozukuri will be part of my whole life from now on.

I agree a lot with the professor about learning from experience is one of the best approaches to master any processes. More important in actual industries when it is not allowed to commit mistakes in the final product.

All the people that were featured in the videos, their experience and advice is very valuable and very helpful.

Learning from Emeritus Professor Masahiro Mori, the reading text about Emeritus Professor Shigeo Hirose, learning the engineering principles of pop-pop boat, learning the experience and wisdom of Professor Tanaka. I love learning from all those people I wish I could meet them.

Monozukuri

東京工業大学 Tokyo Institute of Technology

17

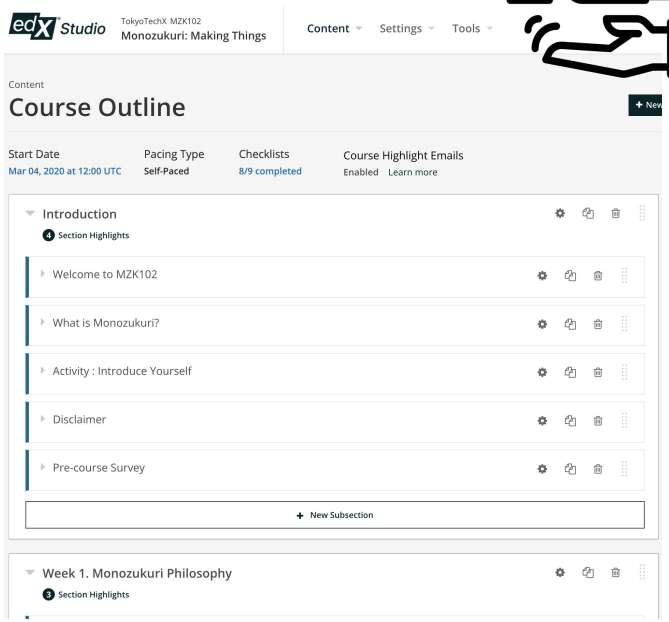
Topic Modeling in MOOCs: What Was to Be Discussed, What the Instructor Discussed, and What the Learners Discussed

May Kristine Jonson Carlon, Anie Day DC Asa, Nopphon Keerativoranan, Toru Nagahama, Jeffrey Scott Cross

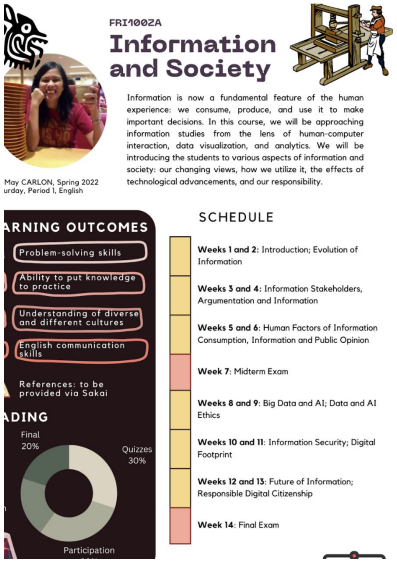
IEEE TALE 2021

Skills I developed from the GSA-D experience

Instructional Design

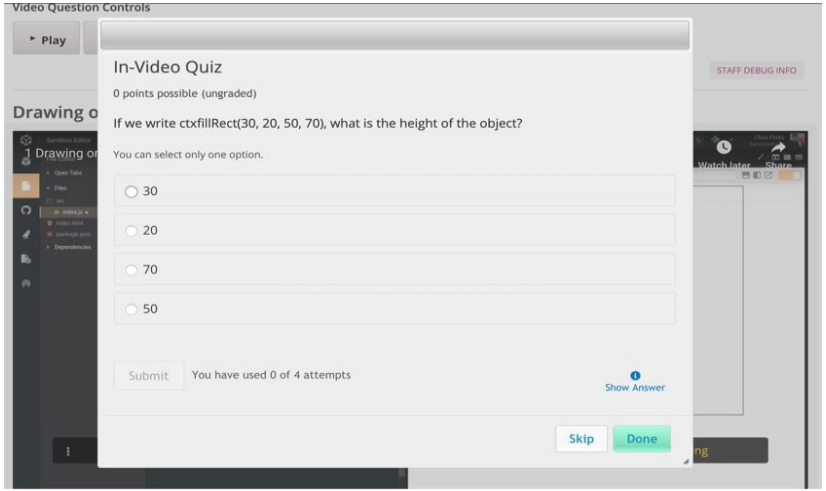


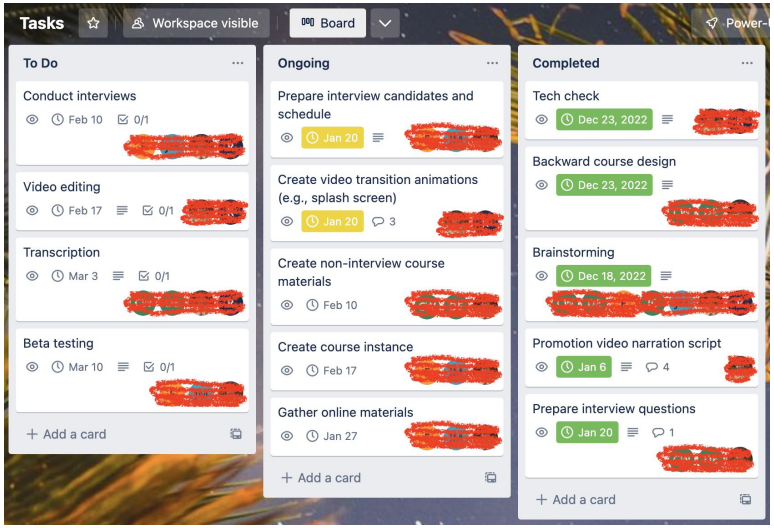
Content Creation



Skills I brought into the GSA-D program

Web Development

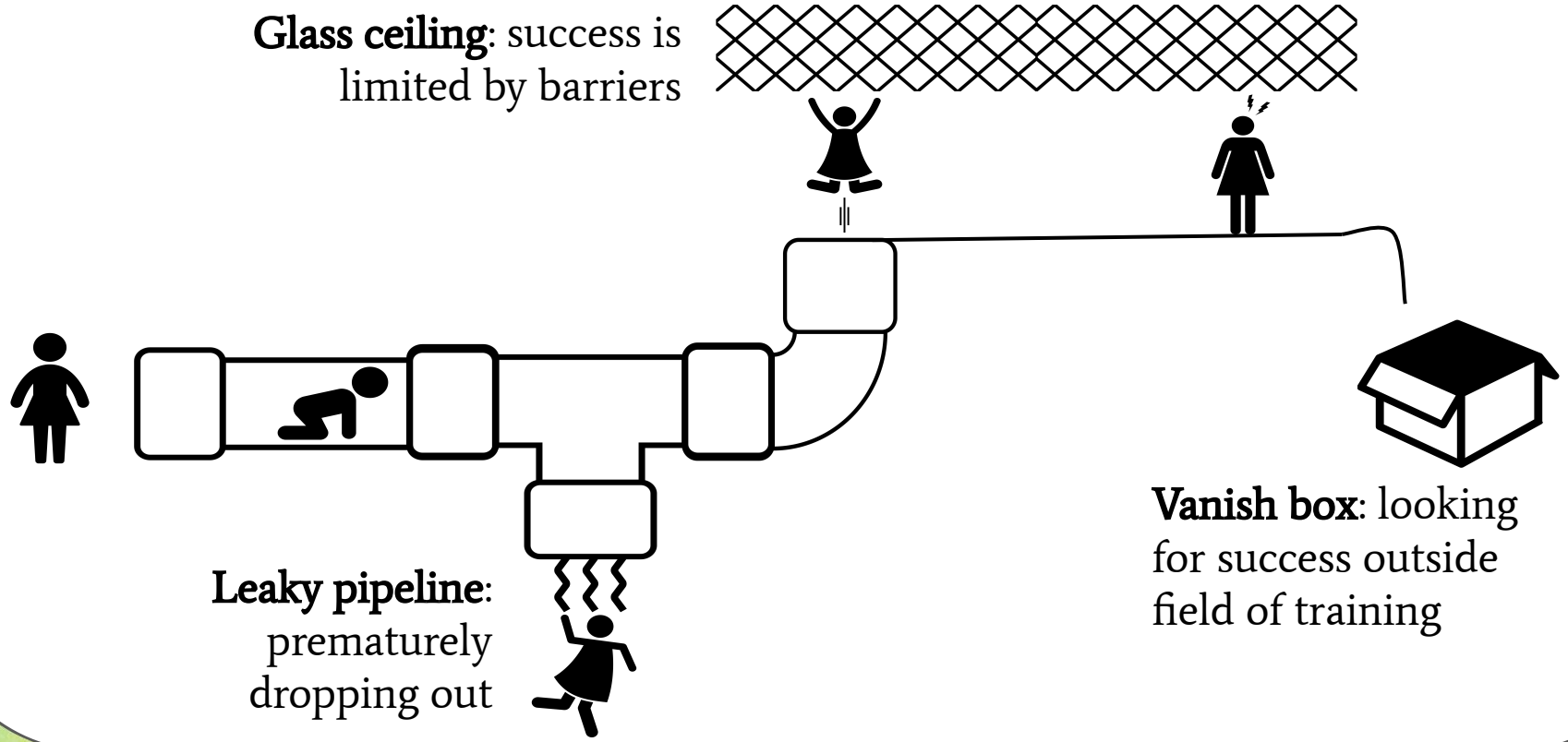




Project Management

Final thoughts: Analogs with Women in STEM

Glass ceiling: success is limited by barriers



Leaky pipeline: prematurely dropping out

Vanish box: looking for success outside field of training

Thank you for your attention