



Northwestern
University

Introduction to Data Visualization & Data Storytelling

Week 5





Recap



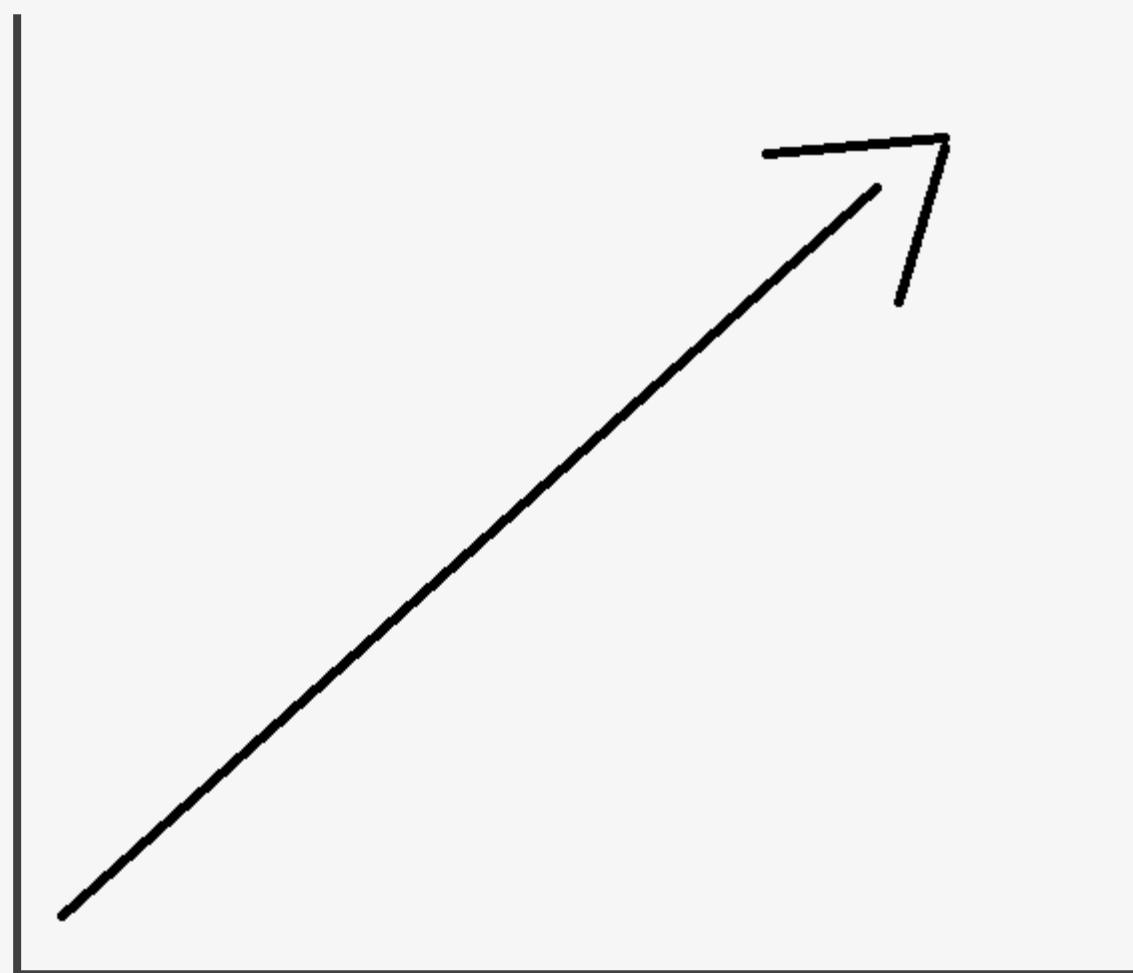
Assignment 2 Spotlight

*What's the first step
in the data viz
process?*

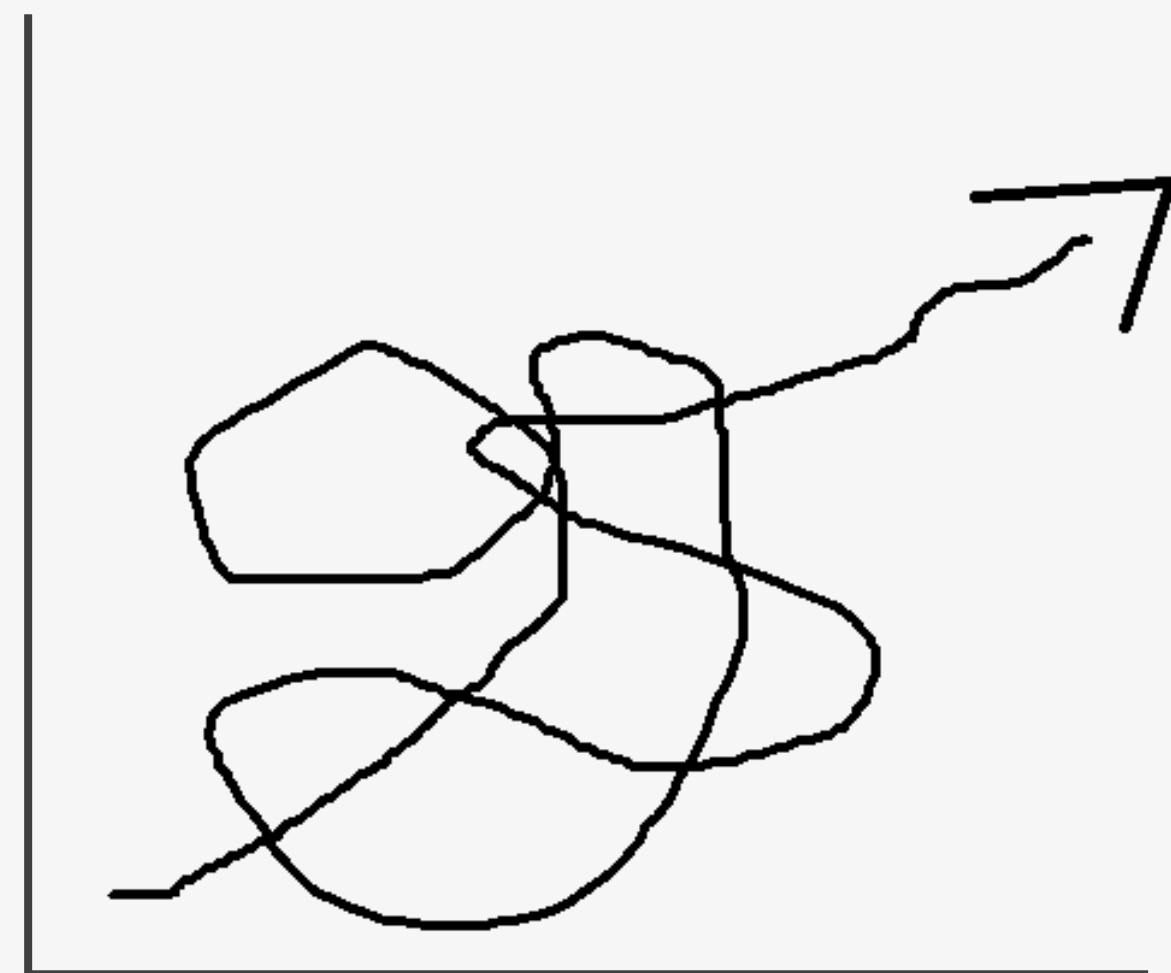


*What's the most
challenging step in
the data viz process?*





PLAN



REALITY




SCENARIO





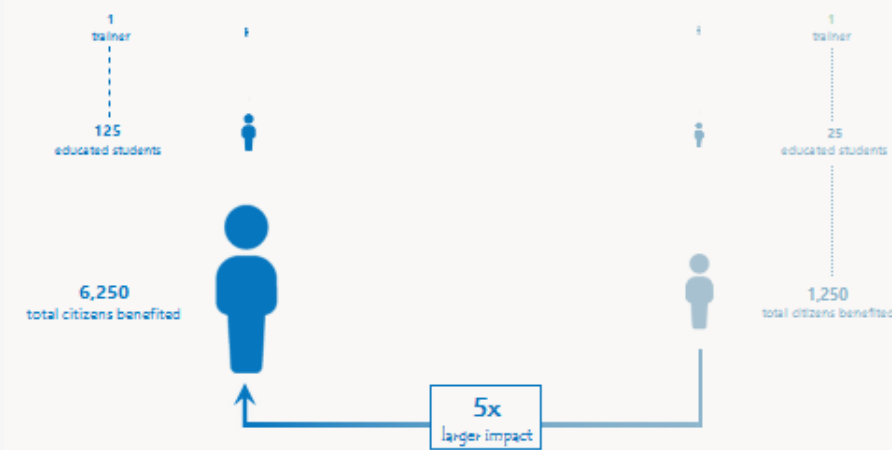
EDUCATION IS KEY TO A FLOURISHING SOCIETY




 **THE POWER OF ONE:** Through the “train-the-trainer” model that AWB uses, each project builds local capacity and expertise, creating sustainable programs that are multiplied and persist long after the volunteers return home.

Impact of 1 AWB “Train the Trainer” Volunteer
1 trainer works with 5 local faculty.
Each local faculty teaches 25 students.
Each student then impacts on avg. 50 citizens.


Impact of 1 Regular Visiting Instructor
1 trainer teaches 25 students.
Each student then impacts on avg. 50 citizens.



 **DIVERSITY OF IMPACT:** In 2018 and 2019, AWB worked on 32 projects across 16 countries. Each project and each country has its own unique story.

Hover over each country to [learn more](#).



 **DONATE!** Help us educate, inspire, empower.

There are many things developing nations need to foster sustainable health and prosperity; education is often the forgotten ingredient. Academics Without Borders (AWB) works to change that by helping developing nation universities build the programs, capacity and plans they need to educate the next generation of professionals and leaders.

Date:
Academics Without Borders,
2018-2019
UNDP

Photo:
Unsplash

Icons:
The Noun Project

Design:
Rebecca Pop

+ a b l e u



Data Visualization Process



Color - category

Size - time needed

BUSINESS | **DATA** | **DESIGN**



define the
business
problem



understand
you audience



understand
your data



data
cleaning &
transformation



find the
story



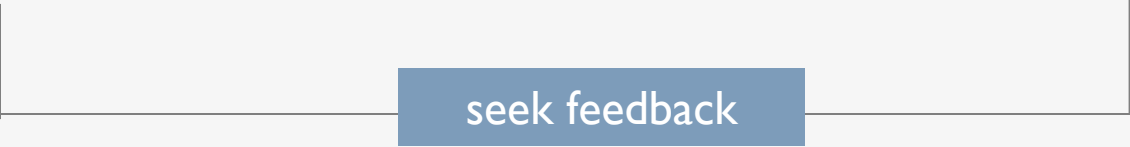
sketch
& iterate



design
& iterate



edit



Step 1: Define the Problem



Academic without Borders (AWB) is an organization that **helps developing nation universities build the programs, capacity and plans they need to educate the next generation of professionals and leaders.**

Visualize the Visiting Instructor vs. AWB's Teach-the-teacher model to prove scale and sustainability to potential donors.

Step 2: Understand Your Audience



Potential donors

- ▶ Size
- ▶ Data literacy
- ▶ Familiarity with the topic
- ▶ Level of seniority
- ▶ Specific needs
- ▶ Time available



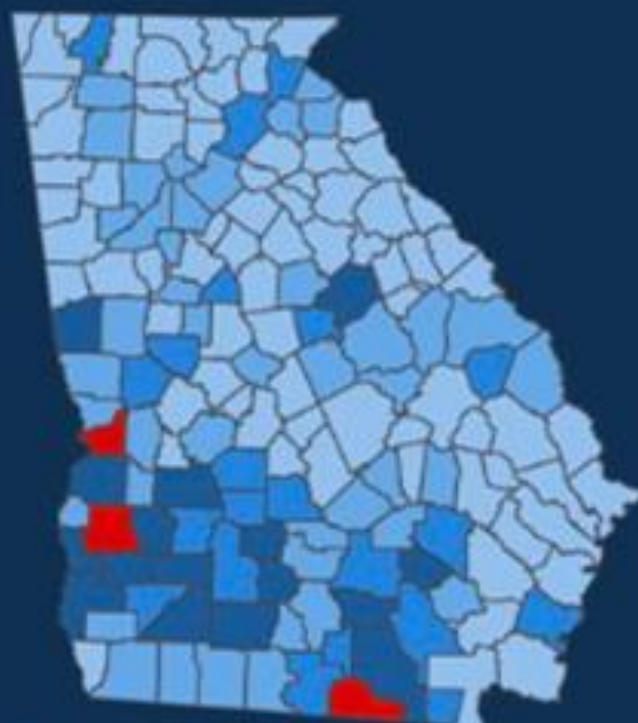
Step 3: Understand Your Data

Project Number	HDI Rank (2018)	HDI Value (2018)	City/Town	Country	Partner Institution	Project Title	Project One-liner	Specific Discipline	Project Year	Volunteering Institution 1	Volunteering Institution 2	Number of Volunteers	Volunteer In-kind + Time Value	Total True Value Project	
83	147	0.579	Bharatpur	Nepal	Chitwan Medical College	MicroResearch Training Workshop	Building research capacity with multi-disciplinary teams through MicroResearch workshops at Chitwan Medical College.	Medicine	2017	Dalhousie University, Canada	Dalhousie University, Canada	10	\$1,450	\$16,800	\$22,592
84	123	0.670	Georgetown	Guyana	Georgetown Public Hospital Cooperation	Research Training for Family Medicine Residents	Training to develop family medicine research skills for medical residents at Georgetown Public Hospital	Medicine	2017	University of Ottawa, Canada	Northern Ontario School of Medicine, Canada		\$4,665	\$44,800	\$58,368
85	V: 118 C: 146	V: 0.693 C: 0.581	Hanoi, Vietnam Phnom Penh, Cambodia	Vietnam Cambodia	Vietnam National University - University of Social Sciences & Humanities / Royal University of Phnom Penh	Research Training for Social Work & Development Studies	Training in research for social work and development studies at Vietnam National University-University of Social Sciences and Humanities- Hanoi. Funding by Djavad Mowafaghian Foundation.	Social Work	2017	University of Calgary, Canada			\$950	\$13,759	\$16,701
													\$1,200	\$19,292	\$24,483
													\$400	\$33,600	\$45,176
													\$750	\$22,400	\$28,024
													\$4,900	\$24,000	\$32,335
86	63	0.799	Novi Sad	Serbia	University of Novi Sad	Natural Resource Conservation	Training to develop capacity in natural resource management and ecotourism for regional economic development at the University of Novi Sad. Funding by Djavad Mowafaghian Foundation.	Geography	2018	University of Manitoba, Canada			\$0	\$36,800	\$45,701
													\$0	\$20,000	\$23,803
													\$0	\$30,891	\$34,770
												\$0	\$42,432	\$49,153	
												\$1,301	\$27,707	\$34,646	
87	134	0.617	Mbarara	Uganda	Mbarara University of Science & Technology	MicroResearch Training Workshop	Building medical research capacity focusing on maternal and infant health through MicroResearch Training workshops at the Mbarara University of Science and Technology.	Medicine	2018	Dalhousie University, Canada					
88	142	0.596	Hohoe, Volta Region	Ghana	University of Health and Allied Sciences	Graduate Programs in Public Health	Building capacity to deliver graduate programs in Public Health at the University of Health and Allied Sciences	Public Health	2017	University of Alberta, Canada		\$44,245	\$204,772	\$204,405	
#	Visiting Instructor Social Impact multiplier							Data Element	Description						
1	1 expat nursing faculty member teaches one class of students on a single extended visit (perhaps one semester)							Number	Project Number						
2	25 students in the class							(2018)	Human Index Rank 2018 of country where AWB provided the service						
3	Each of the 25 graduates (now nurse social workers) works with an average of 50 clients per year							(2018)	Human Index Value 2018 of country where AWB provided the service						
4	1250 clients (= 1 class X 25 graduates/class X 50) are served in the first year and subsequent years as long as the graduates continue to work in their field							City	City where the service was provided						
5	Further trained graduates would only be possible with the return of the ex-pat faculty member							Country	Country where the service was provided						
								Institution	Partner institution where the service was provided						
								Title	Project Title						
								One-liner	Project Description						
								Discipline	Discipline of project; if blank then it means there was no specific discipline						
								Year	Year in which project commenced						
								Volunteering Institution 1	The institution where the volunteer came from						
								Volunteering Institution 2	The institution where the volunteer came from; for many projects volunteers can come from multiple institutions						
								Volunteering Institution 3							
								Volunteering Institution 4							
								Volunteering Institution 5							
								Volunteering Institution 6							
	We are looking for a visualization to demonstrate the impact of the Visiting instructor approach. Please feel free to create underlying data to support the viz														

Example



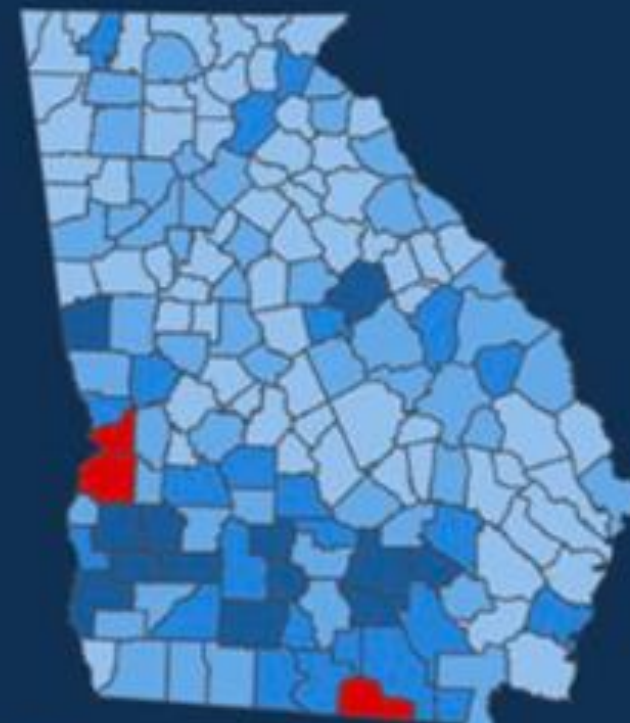
Cases per 100K▼



Cases per 100K



Cases per 100K▼



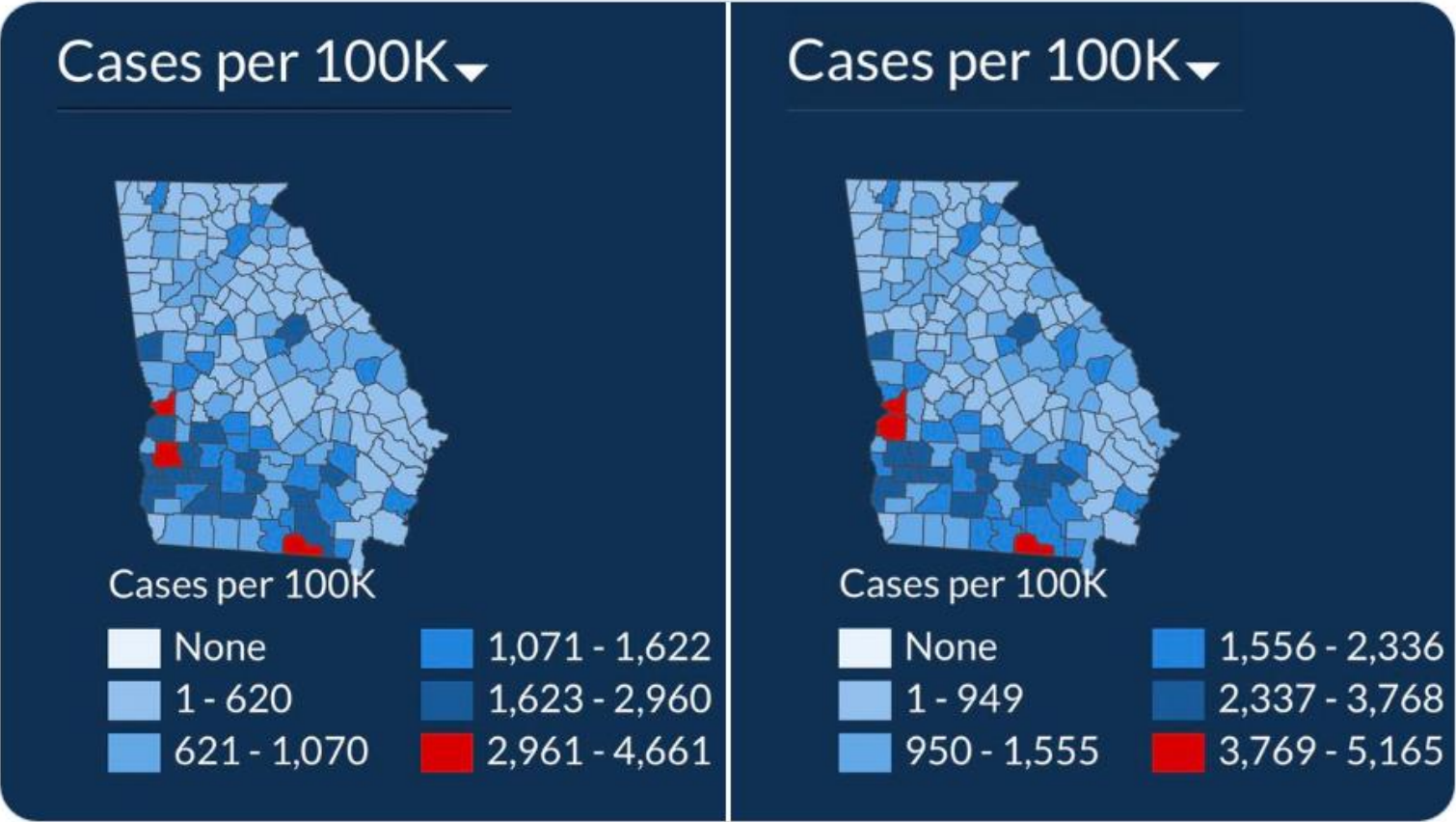
Cases per 100K



Example: Data Pitfall

Andisheh Nourae
@andishehnourae

In just 15 days the total number of #COVID19 cases in Georgia is up 49%, but you wouldn't know it from looking at the state's data visualization map of cases. The first map is July 2. The second is today. Do you see a 50% case increase? Can you spot how they're hiding it? 1/



4:24 PM · Jul 17, 2020 · Twitter for iPhone

Tim Pritlove @timpritlove · Jul 19
How to lie with data.

Andisheh Nourae

In just 15 days the total number of #COVID19 cases in Georgia is up 49%, but you wouldn't know it from looking at the state's data visualization map of cases. The first map is July 2. The second is today. Do you see a 50% case increase? Can you spot how they're hiding it? 1/

Cases per 100K



5



Stephanie Evergreen @evergreendata · Jul 18
The combo of John Lewis and this effing deceitful map are totally crumbling my heart today. This world... ❤️

Andisheh Nourae

In just 15 days the total number of #COVID19 cases in Georgia is up 49%, but you wouldn't know it from looking at the state's data visualization map of cases. The first map is July 2. The second is today. Do you see a 50% case increase? Can you spot how they're hiding it? 1/

Cases per 100K



3



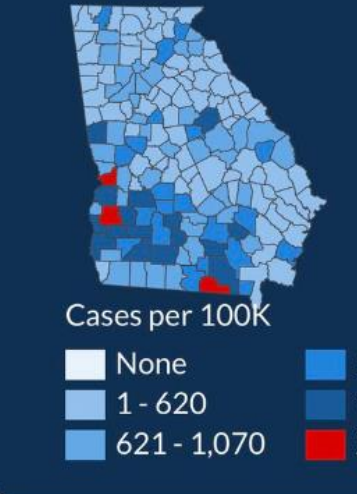
Tom Nichols @RadioFreeTom · Jul 18
This is really a stunning manipulation of a chart, meant to make stupid people feel better because they will look at pictures instead of the numbers right under the picture.

Andisheh Nourae

In just 15 days the total number of #COVID19 cases in Georgia is up 49%, but you wouldn't know it from looking at the state's data visualization map of cases. The first map is July 2. The second is today. Do you see a 50% case increase? Can you spot how they're hiding it? 1/

Show this thread

Cases per 100K



91

552

1.2K

↑

Example: Data Pitfall

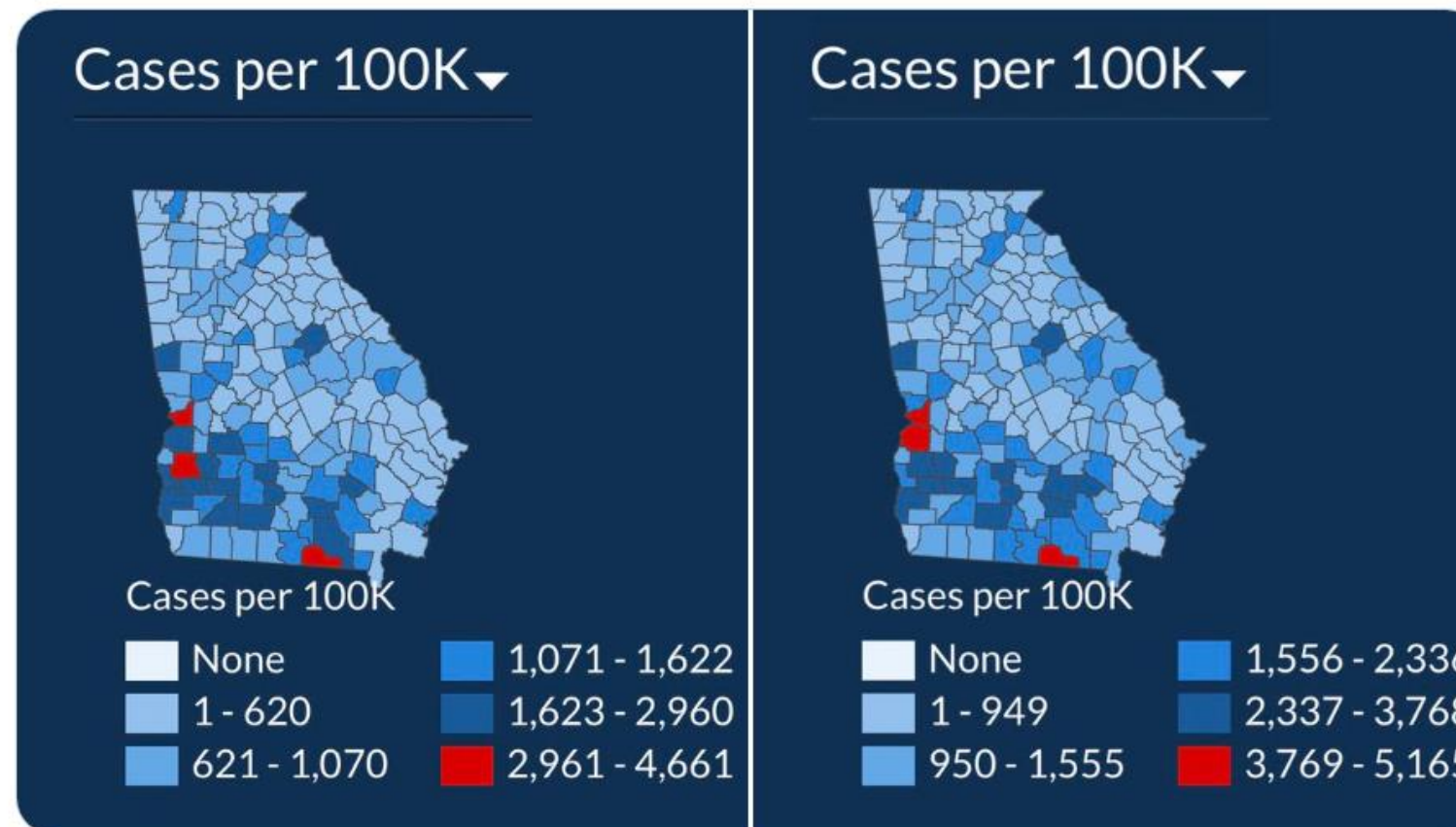


Andisheh Nourae

@andishehnourae



In just 15 days the total number of [#COVID19](#) cases in Georgia is up 49%, but you wouldn't know it from looking at the state's data visualization map of cases. The first map is July 2. The second is today. Do you see a 50% case increase? Can you spot how they're hiding it? 1/



4:24 PM · Jul 17, 2020 · [Twitter for iPhone](#)

26K Retweets and comments **47.6K** Likes

Example: Data Pitfall



Jorge Camoes

@wisevis



So we are entering a new [#dataviz](#) era where you cherry pick a small part of a visualization, declare that it should answer your random question, create a silly comparison and declare the whole thing malicious or incompetent.

Let me out, please.

4:33 AM · Jul 19, 2020



64



See Jorge Camoes's other Tweets



John Burn-Murdoch @jburnmurdoch · Jul 19



There's a large, growing and frustrating trend in people seeking to attribute anything they disagree with on Covid to malicious intent.

True of reactions to charts, numbers, actions, words.

Lots of people would apparently rather be outraged than informed.



6



23



99



Step 5: Data Transformation



#	AWB Teach the Teacher Social Impact Multiplier
1	1 AWB volunteer faculty member works with 5 local faculty members to develop new program curriculum and and practicums in a mixture of online and onsite work
2	1 AWB volunteer faculty member co-teaches program with local faculty on a single extended visit (perhaps one semester), thus training them on how to teach the course
3	Each of the 5 faculty members then teach classes of 25 students in the program for a total 125 students per year
4	Each graduate of the new specialization program (now nurse social workers) then works with an average of 50 clients per year
5	6250 clients (= 5 classes X 25 graduates/class X 50) are served in the first year as a result of the project, but...
6	Program is offered in each subsequent year by AWB trained local faculty with the same impact resulting in 125 graduates per year who each serve 50 clients
7	As a result the impact of the AWB project grows annually by the graduation of additional nurse social workers
8	The important impact is that trained local faculty both offer the program themselves and pass on teaching capacity to other faculty members and the program is sustained
	We are looking for a visualization to demonstrate the impact of the Teach the Teacher approach. Please feel free to create underlying data to support the viz

#	Visiting Instructor Social Impact multiplier
1	1 expat nursing faculty member teaches one class of students on a single extended visit (perhaps one semester)
2	25 students in the class
3	Each of the 25 graduates (now nurse social workers) works with an average of 50 clients per year
4	1250 clients (= 1 class X 25 graduates/class X 50) are served in the first year and subsequent years as long as the graduates continue to work in their field
5	Further trained graduates would only be possible with the return of the ex-pat faculty member
	We are looking for a visualization to demonstrate the impact of the Visiting instructor approach. Please feel free to create underlying data to support the viz

	Teach the Teacher	Visiting Scholar
Volunteer	1	1
Local faculty members	5	0
Local students taught	125	25
Clients served	6,250	1,250

Row Labels	Count of Partner Institution
Kenya	21
Ghana	15
Liberia	13
Rwanda	9
Nepal	8
Ethiopia	8
Uganda	7
Tanzania	5
Indonesia	4
Ethiopia	2
Colombia	2
Namibia	2
India	2
Guyana	2
Sierra Leone	2
Bhutan	2
	1
	1
	1

Disciplines -use

Copy of AWB Data Viz for Social Good Final

```
if [Country]="Uganda" then "Medicine and Fine Arts"
ELSEIF [Country]="Kenya" then "Medicine"
ELSEIF [Country]="Rwanda" then "Medicine"
ELSEIF [Country]="Nepal" then "Public Health & Medicine"
ELSEIF [Country]="India" then "Veterinary and Medicine"
ELSEIF [Country]="Ethiopia" then "Statistics and Medicine"
ELSEIF [Country]="Tanzania" then "Medicine"
ELSEIF [Country]="Serbia" then "Geography"
ELSEIF [Country]="Senegal" then "Environmental Policy"
ELSEIF [Country]="Sudan" then "Migration Studies"
ELSEIF [Country]="South Africa" then "Academic Writing"
ELSEIF [Country]="Guyana" then "Medicine"
```

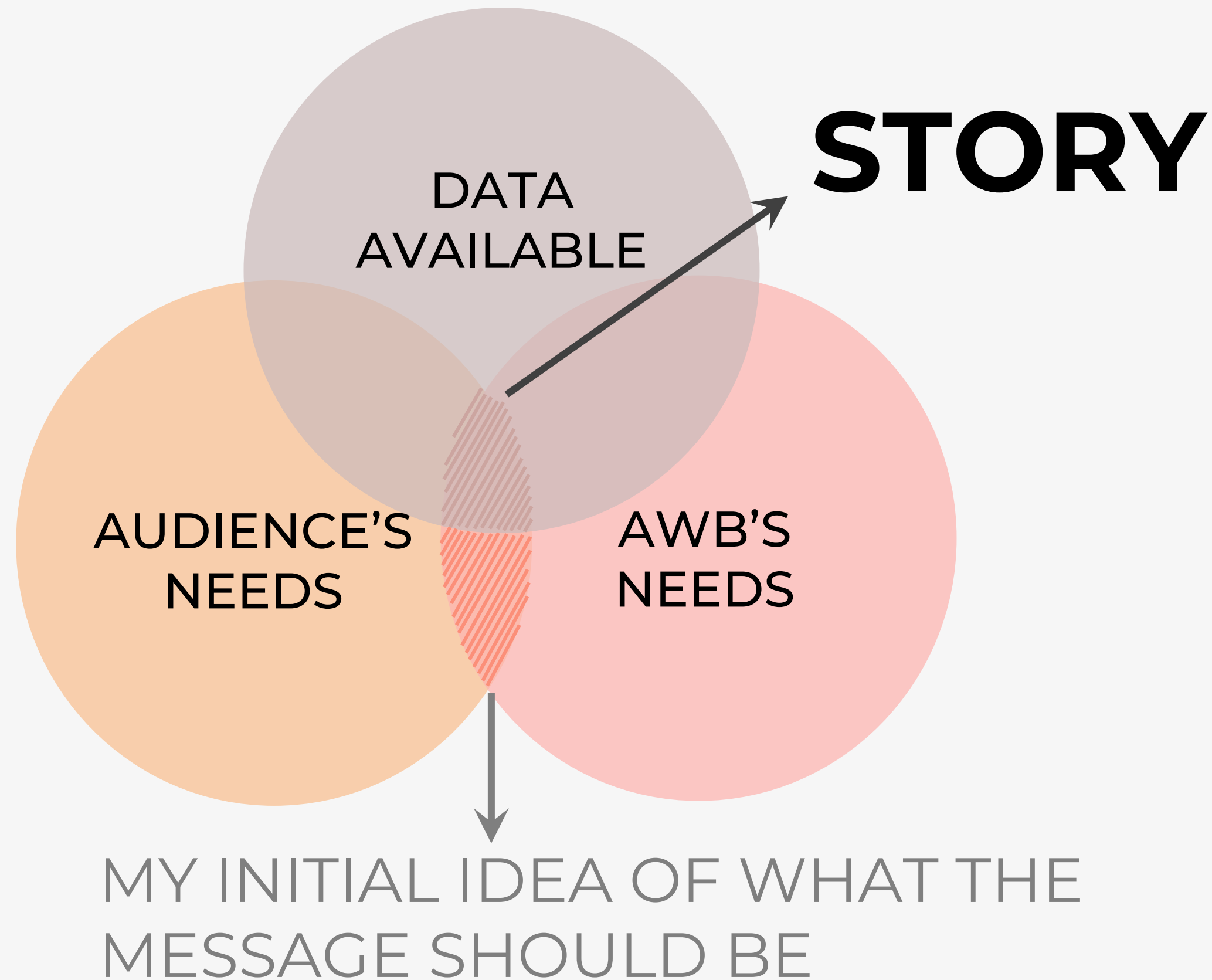
The calculation is valid.

6 Dependencies

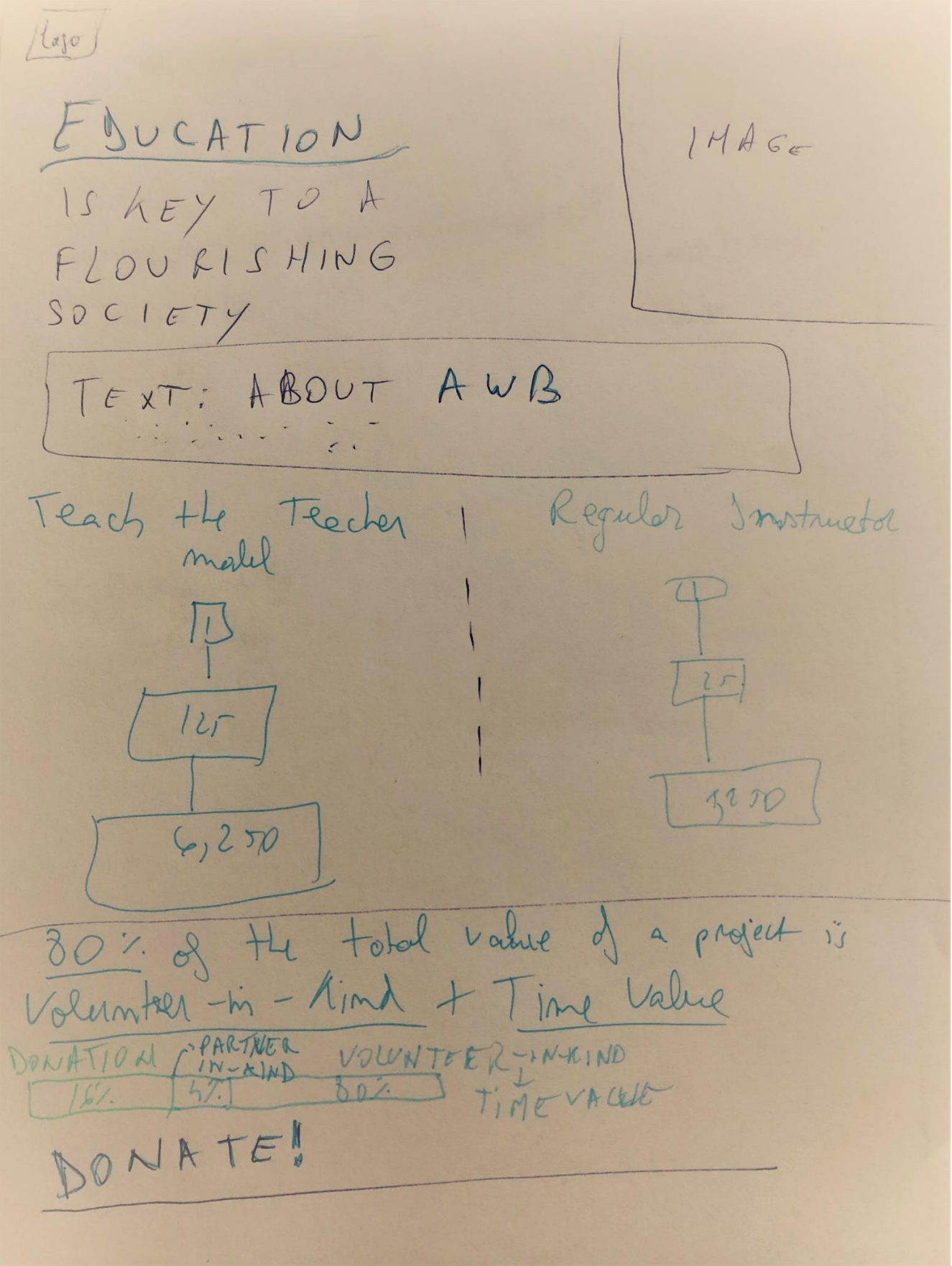
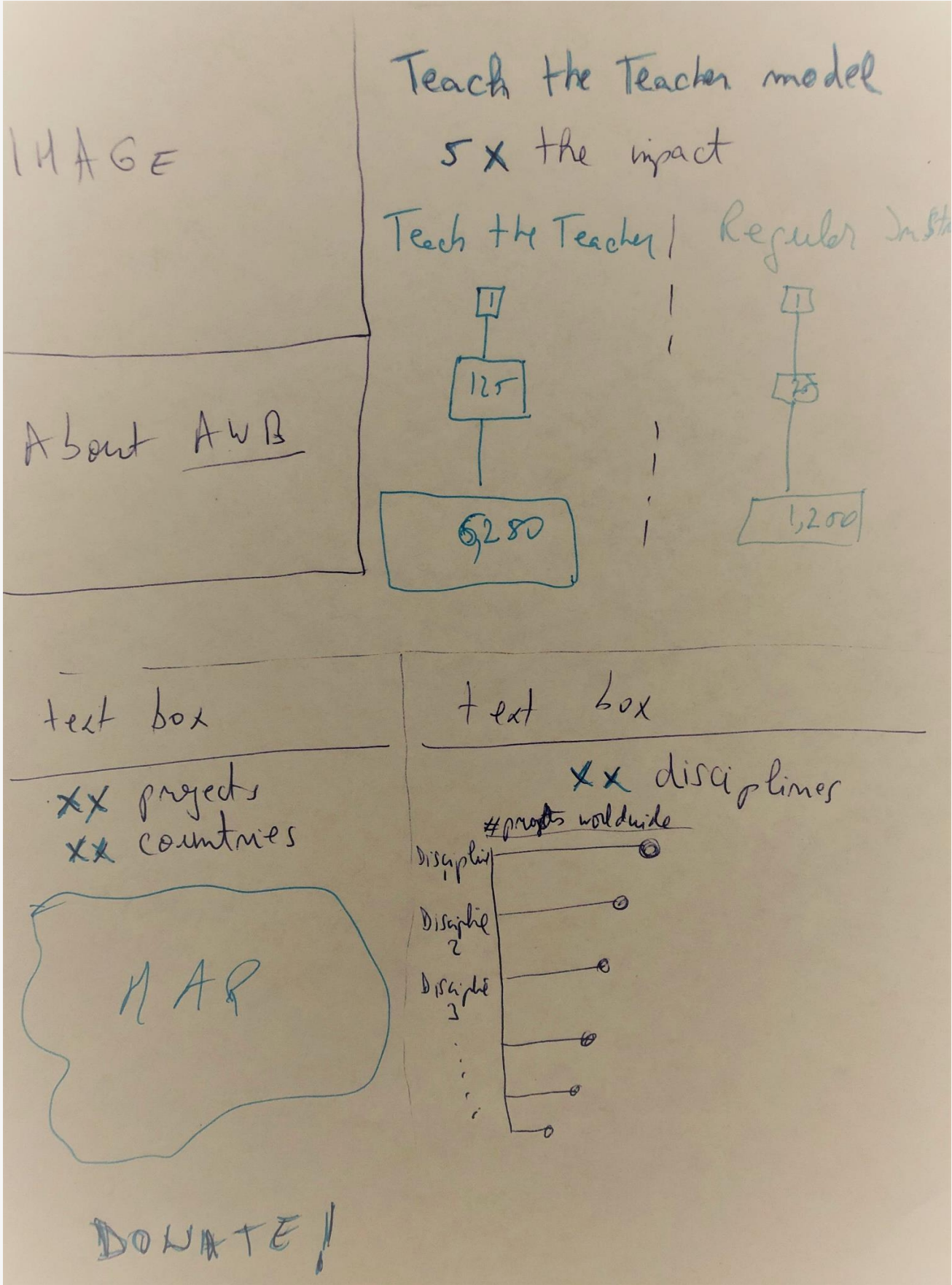
Apply

OK

Step 6: Find the Story



Step 7: Sketch



→

Step 8: Design



AWBIUSF
Academics Without Borders
Universitaires sans frontières

Promoting development through higher education

There are many things developing nations need to foster sustainable health and prosperity; **education** is often the forgotten ingredient. **Academics Without Borders (AWB)** works to change that by helping developing nation universities build the programs, capacity and plans they need to educate the next generation of professionals and leaders.





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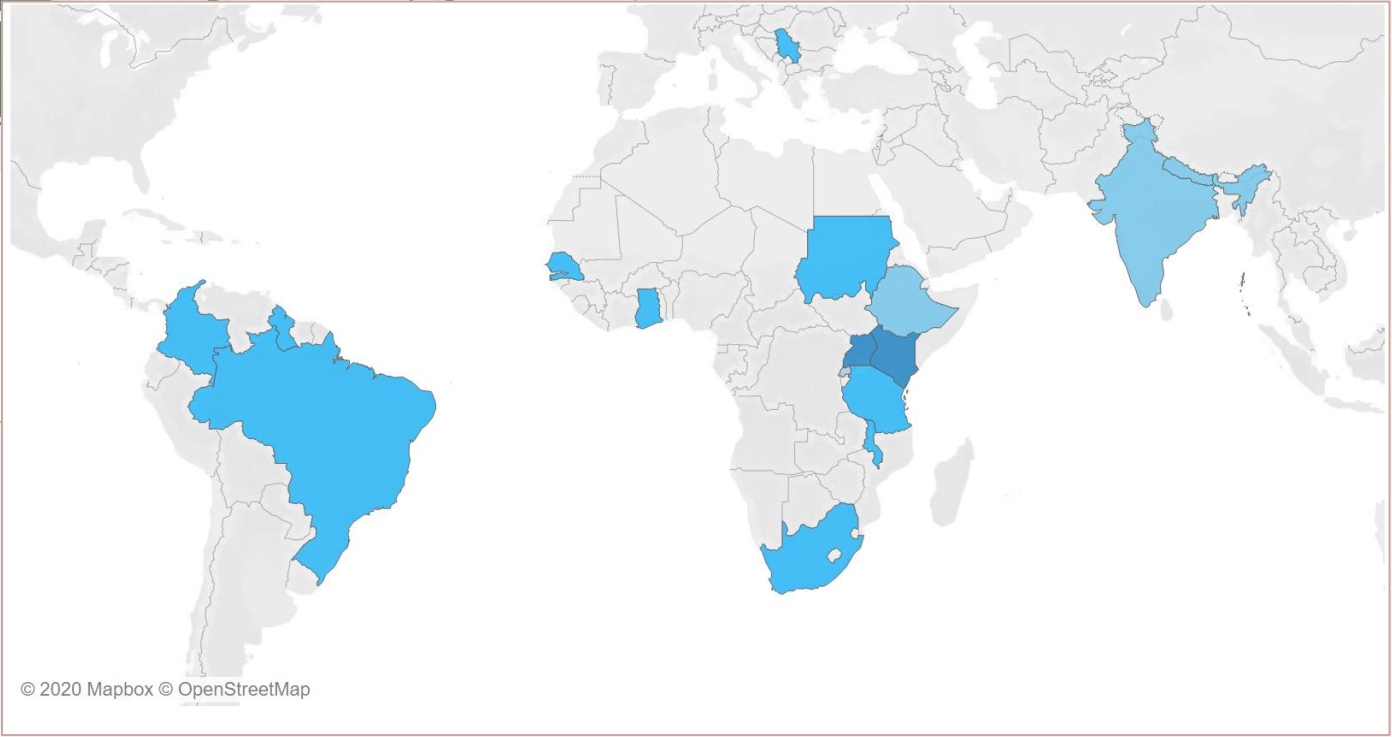
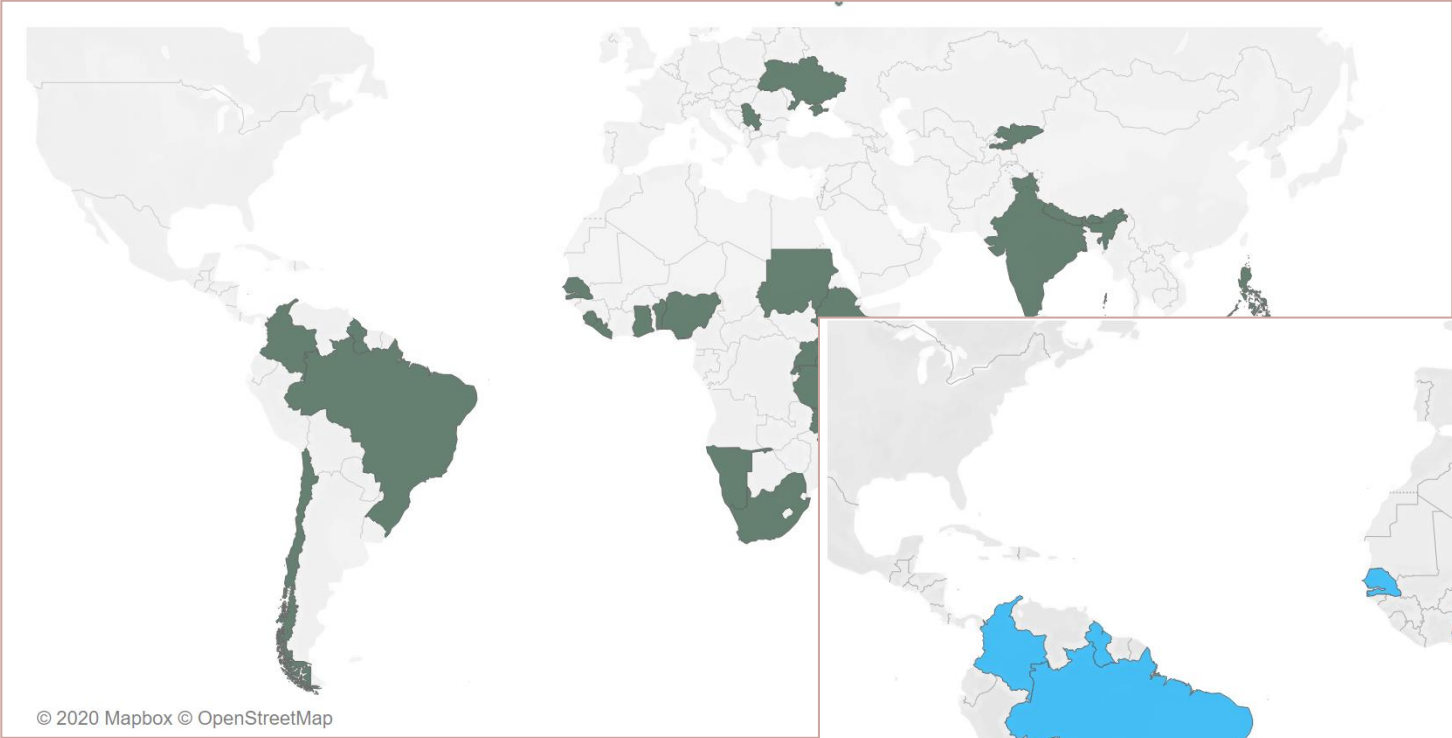




AWBIUSF
Academics Without Borders
Universitaires sans frontières



Promoting development through higher education



DONATE!



Help us educate, inspire, empower!

Data:

Academics Without Borders
UNDP

Photo:

Unsplash

Icons:

The Noun Project

Design:

Rebeca Pop

Step 9: Edit, Edit, Edit



EDUCATION IS KEY TO A FLOURISHING SOCIETY

THE POWER OF ONE: Through the “train-the-trainer” model that AWB uses, each project builds local capacity and expertise, creating sustainable programs that are multiplied and persist long after the volunteers return home.

Impact of 1 AWB “Train the Trainer” Volunteer
1 trainer works with 5 local faculty.
Each local faculty teaches 25 students.
Each student then impacts on avg. 50 citizens.

Impact of 1 Regular Visiting Instructor
1 trainer teaches 25 students.
Each student then impacts on avg. 50 citizens.

1
trainer

125
educated students

1
trainer

1
trainer

25
educated students

6,250
total citizens benefited

1,250
total citizens benefited

5x
larger impact

DIVERSITY OF IMPACT: In 2018 and 2019, AWB worked on 32 projects across 16 countries. Each project and each country has its own unique story.

Hover over each country to [learn more](#).

© 2020 Mapbox © OpenStreetMap

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Date:

Academics Without Borders,
2018-2019
UNICEF

Photo:

Unsplash

Icons:

The Noun Project

Design:

Rabeca Pop

+ a b | e a u

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⌂

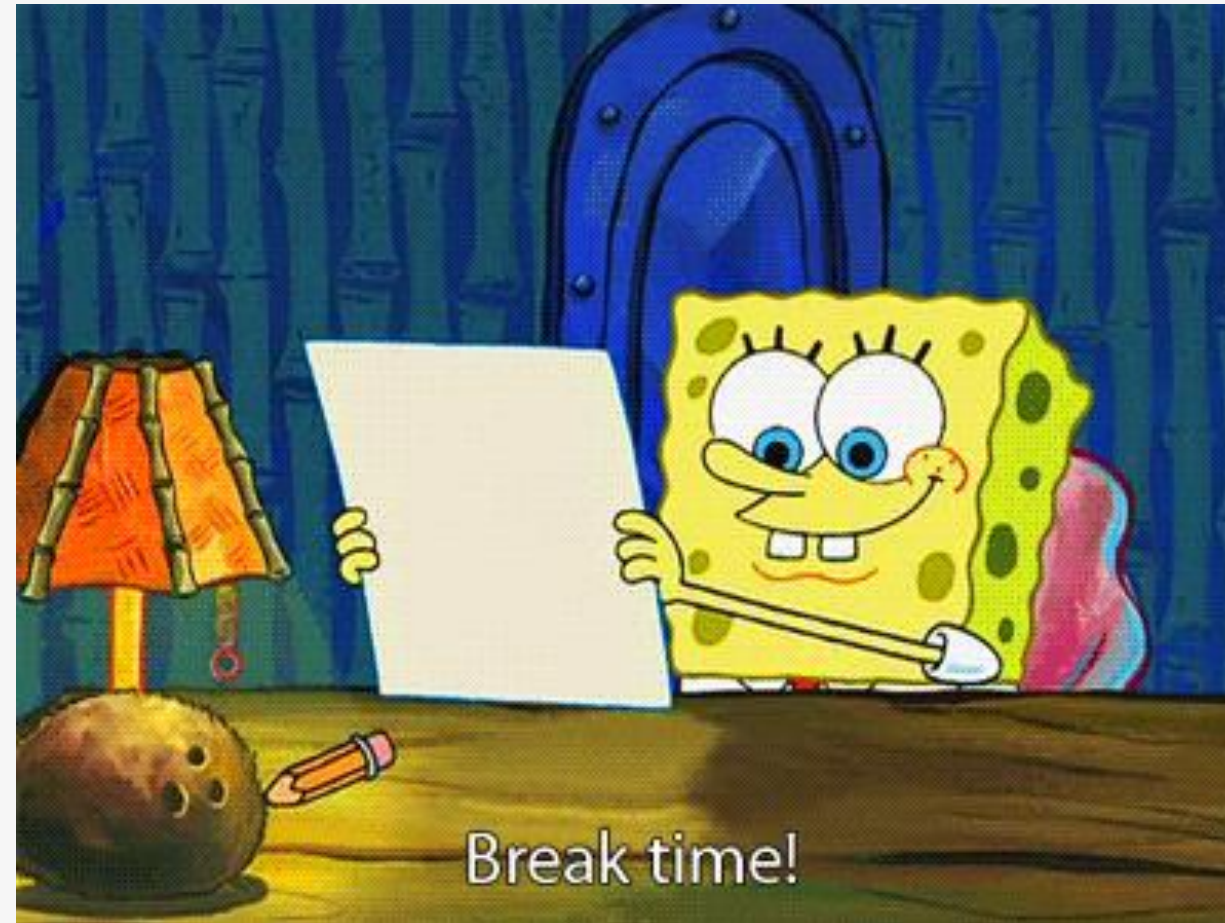
🔍

📄

🔧

Break

15 minutes





Exercise



Data Visualization Process



Color - category

Size - time needed

BUSINESS | **DATA** | **DESIGN**



define the
business
problem



understand
you audience



understand
your data



data
cleaning &
transformation



find the
story



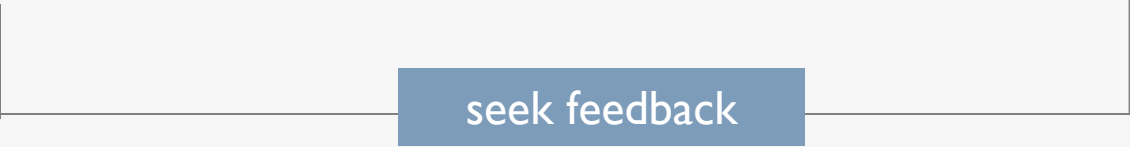
sketch
& iterate



design
& iterate



edit



Practice: Flourish, RAWGraphs, Datawrapper (pick one)

Work in pairs of two

Data: cost of pizza slices in NYC

Audience: two friends looking to open a pizza restaurant in NYC and trying to better understand the market and prices of pizza slices

Requirements:

1. Define the business problem
2. Evaluate the audience
3. Understand the data (make any data transformation you see necessary)
2. Find the story
3. Sketch two chart types
4. Select the final chart and design it in a tool: Flourish, RAWGraphs or Datawrapper

WHAT DID
YOU LEARN?

