



INFORMATION EVALUATION

A Research in Complex Adaptive System

DMGT 710-01
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INTRODUCTION

As design students, we were interested in understanding how information is presented and interpreted in our everyday lives. Specifically, how one establishes ways to research information in an accurate and systematic way.

By using both primary and secondary research, we designed multiple rounds of prototypes to reach a solution.



MEET THE TEAM



Alisha Saxena



Laura Rubio



Kathleen Black



Wenting Zhu



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Section 1

Defining Concepts

- 1.1 Secondary Research
- 1.2 Topics and Brainstorming (per team)
- 1.3 First test of Articles
- 1.4 Defining Topic



Secondary Research

Starting to choose a topic for research

We started this project as two separated groups (Group A: Alisha and Kathleen, Group B: Laura and Wenting) and each one came up with personal topics of interest to start a secondary research.

Group A

Popular Searches
Information
Cultural facts
Information Accuracy
Emotional News
Fake News
Google Searches

Group B

Evaluation
Transparency
Information
fake news
Misinformation
truth/reality
perception/psychology
diffusion/channel



Secondary Research

Starting to choose a topic for research

Group A

About Assessing Information:

*“In such a world, the last thing a teacher needs to give her pupils is more information. They already have far too much of it. Instead, people need the ability to make **sense of information**, to tell the difference between what is important and what is unimportant, and, above all, to **combine many bits of information** into a broad picture of the world.”*

(Yuval Noah Harari, 2018)

Group B

About Misinformation:

*“The **misinformation** effect occurs when the recollection of an event changes because new, misleading information about the event is received”*

(Stille L, Norin E, Sikström S, 2017)

“”



Topics and Brainstorming

Sharing topics and takeaways

By sharing part of the secondary information and topics of interest between us, we made the following:

Group A

“ We were interested in the **by whom** the information is being created and published ? Also, Why people want search certain types of topics versus other ones and why people are so **interested in GOSSIP** and how does this lead to **evaluation of information?** Therefore, understanding The **Complex Systems** by whom the Information is published and how is it convincing to be true.”

Group B

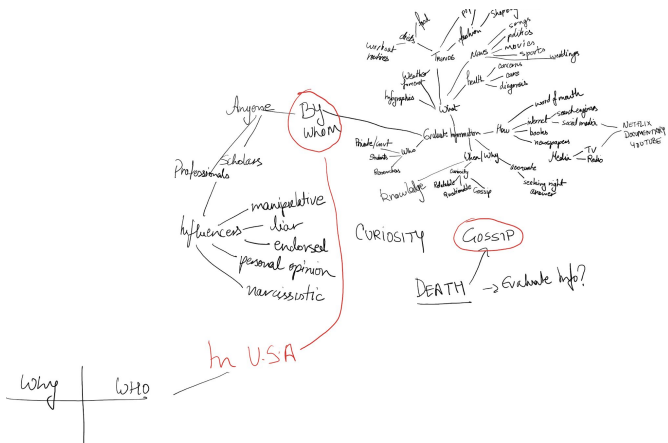
“We were interested in **fake news, misinformation**, so by using “**brainstorming**” method these concepts translated to understand how are the things that people take in mind to **evaluate information**. Also que wanted to see **how is people’s impact around both topics**, their understanding while reading and appropriating information that can be or not true.”



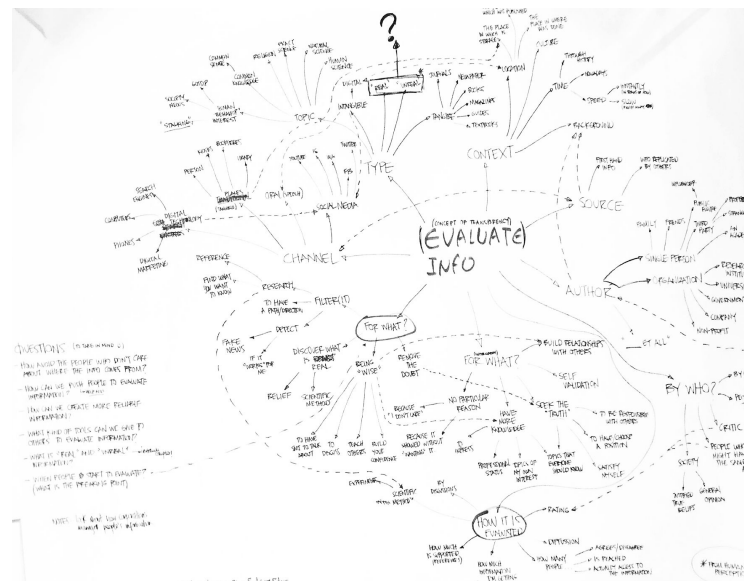
Topics and Brainstorming

Sharing topics and takeaways

Group A



Group B



By sharing part of the secondary information and topics of interest between us, we (each group) ran a test in which we wanted see how people perceive different information given (e.g: articles, fake news, scientific research, social media etc).

First Test Articles

Group A

We created a fake news article and shared it through Social Media. People comment on it with many different reactions. See right.

[Link to Fake Article](#)



A screenshot of a Facebook post. At the top right is a small bee icon. The post header shows a profile picture of a woman, a redacted name, and the date 'January 21'. The text of the post says 'Check this out — It really works'. Below this is a featured image of a hand holding a white coffee cup, with a text overlay from 'REACT365.COM' titled 'Secret to longer, stronger and healthier nails... Coffee!' and a paragraph about brittle nails. Below the image are interaction buttons for 'Like', 'Comment', and 'Share', and a notification 'You and Barbara Nix' with '5 Comments'. The comment section contains four entries: 1) 'trying this!' with 'Like · Reply · 6w'; 2) 'good clear sealing polish works best on me. One coat and a lot of hand lotion.' with 'Like · Reply · 6w'; 3) 'What no more Palmolive?!' with 'Like · Reply · 6w' and a sub-reply 'Patti Zenock Gibbons replied · 1 Reply'; 4) 'ouldn't that stain your nails?' with 'Like · Reply · 6w' and a laughing face emoji.



First Test Articles

Group A: What do we wanted to test?

Myth #4: Not feeling sore means you didn't get a good workout.

Truth: While soreness and workout intensity are sometimes connected, how tired your muscles feel isn't always a good indicator of a solid sweat session. "Being sore doesn't necessarily mean it was a great workout—it just means that a significant amount of stress was applied to the tissue," says exercise physiologist and trainer [Pete McCall](#), M.S., C.S.C.S., host of the [All About Fitness podcast](#). "You can have a great workout and not be sore the next day," he says. Proper recovery will help prevent achy muscles. "Refuel within the first 30 to 45 minutes post-exercise, stay hydrated, and get enough sleep—all of these things can help boost recovery and minimize soreness."

- We selected the following articles because it was a myth. We found that it would be an interesting article to test individuals critical thinking because it taps into individuals emotions.

[Exercise article here](#)

Researchers Show Parachutes Don't Work, But There's A Catch

December 22, 2018 · 8:01 AM ET
Heard on Weekend Edition Saturday



A study found that parachutes were no more effective than empty backpacks at protecting jumpers from aircraft. There was just one catch.

- We selected the following articles because it was presented in class. We found that it would be an interesting article to test individuals critical thinking.

[Parachute article here](#)



First Test Articles

Group A: Raw Data from Questionnaire

Persona Name	Age	Sex	Profession	Highest Level of Education	Year of Completion	News Source:			Article	Emotional Attachment	Believe it?	Catch?	Eager to know more?
						National Broadcast	Newspaper	Social Media					
Bob	56<	Male	Retired, Former Banker	College Degree	1968	1	2	3	Parachute	3	Yes	Yes	Yes
						1	2	3	Exercise	2	No	No	No
Rachel	18-25	Female	Student, Waitress	Bachelors Degree	2017	2	3	1	Parachute	2	No	Yes	No
						2	3	1	Exercise	4	50/50	Yes	Yes
Roxy	36-45	Female	None, Homeless Law	Didnt want to say	-	1	2	3	Exercise	4	Yes	No	Yes
						1	2	3	Parachute	1	No	Yes	No
Stanley	26-35	Male	Enforcement, Security	BA in Criminal Justice	2004	2	3	1	Parachute	5	No	Yes	Yes
						2	3	1	Exercise	3	No	No	50/50
Suzan	26-35	Female	Motion Media Design	MA	2012	1	3	2	Parachute	2	50/50	Yes	No
						1	3	2	Exercise	3	Yes	No	No
Kesha	18-25	Female	Coach/ Musician	Beauty School	2014	2	3	1	Exercise	2	Yes	No	Yes
						2	3	1	Parachute	1	No	Yes	No



First Test Articles

Group B: Two topics, 6 articles

Science Articles

True article here

False article here

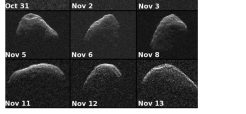
“True” article here

NASA Rules Out Earth Impact in 2036 for Asteroid Apophis

(NASA) Scientists at the agency's Jet Propulsion Laboratory in Pasadena, Calif., officials have ruled out the possibility that asteroid Apophis will impact Earth during a close flyby in 2036. The scientist said updated information obtained by NASA-supported telescopes in 2010 and 2012, as well as new data from the first looking eye Apophis' Earth flyby, revealed that Apophis will not hit Earth in 2036. The asteroid will pass about 31,000 miles (50,000 kilometers) from Earth during that flyby in 2036. Data discovered during a month of all-asteroid images provided the additional information required to rule out the 2036 impact scenario, but a chance possibility of one in 200,000 remained.

"With the new data provided by the Magellan Radar, Ohio, Mexico Institute of Mining and Technology and the Pan-STARRS (Data of Hawaii) optical observations, along with very recent data provided by the Goldstone Solar Radar, we have effectively ruled out the possibility of an Earth impact by Apophis in 2036," said Don Brown, manager of NASA's Near-Earth Object Program Office at JPL. "The impact table we've used since we've had time to re-evaluate, which means a considerable saving in effort, effectively rule out an Earth impact in 2036. Our interest in asteroid Apophis will certainly be for its possible interest for the terrestrial future."

April 13, 2010, after an asteroid Apophis was set in the asteroid belt. On that date, Apophis will become the closest flyby of an asteroid of its size which comes no closer than 19, 000 miles (31,000 kilometers) above Earth's surface.



This series of images shows the asteroid Apophis on Nov. 11-13. The images were taken by the Goldstone Solar Radar. The images show the asteroid's position relative to the Sun and Earth. The images were taken from the Goldstone Solar Radar. The images show the asteroid's position relative to the Sun and Earth. The images were taken from the Goldstone Solar Radar.

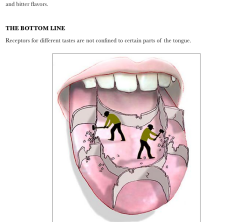
Do Lemmings Really Commit Mass Suicide?



(The Office of Evolutionary Biology) Learning are small rodents with self-organizing. In the 19th century, scientists predicted by the habit of New-England to suddenly appear in large numbers, mostly near of water, came to the realization that the animals were being transported in the air and then falling to the water. The people think that they appear in large numbers, some people think that lemmings exhibit a self-organizing system. This is also a work of science - lemmings are not the case of the water in which they regularly drown. They are not the case of the water in which they regularly drown. They are not the case of the water in which they regularly drown. They are not the case of the water in which they regularly drown.

The Claim: Tongue Is Mapped Into Commit Areas of Taste

(The New York Times) THE FACTS High school students call it the tongue map - that colorful illustration that really divides the tongue into six regions according to taste receptors. There's a tip of the tongue for sweet, the sides for sour and salty, and the back of the tongue for bitter. But recent studies show that while students still have much to learn about receptors, the map is false. Learning. What we know is that there are at least five taste buds, some salty buds and the most sensitive sweet buds. The last buds, which taste "sour," is a general taste bud that can taste any sour and bitter. Most buds, particularly those that taste sour and bitter, are not the case of the water in which they regularly drown. They are not the case of the water in which they regularly drown.



- We selected two main topics each one with three articles (one being true, other false and the third one with the majority of the information true) to develop our first test: 1. Science and 2. Culture

Culture Articles

True article here

False article here

Real names of 23 fictional characters

- 1. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 2. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 3. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 4. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
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- 12. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 13. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 14. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 15. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 16. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 17. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 18. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 19. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 20. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 21. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 22. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.
- 23. **Dr. Frank** - You know the character, but you might not know his full name. Here there are his real name: Frank J. Furter.

The history of Jews, Chinese food, and Christmas, explained by a rabbi

(In the US, Jews have been eating American Chinese food on Christmas for over 100 years) One of the most interesting stories about Christmas is the fact that it is a Jewish-American tradition. It began at the end of the 19th century, when the Lower East Side Jews, who were mostly immigrants from Eastern Europe, began to celebrate Christmas. They did this by eating Chinese food, which was the only food that was available to them at that time. The tradition of eating Chinese food on Christmas has since become a popular holiday tradition for many Jews in the United States.

Entry denied: the identity crisis facing China's covert dual passport holders

(The New York Times) One of the most interesting stories about Christmas is the fact that it is a Jewish-American tradition. It began at the end of the 19th century, when the Lower East Side Jews, who were mostly immigrants from Eastern Europe, began to celebrate Christmas. They did this by eating Chinese food, which was the only food that was available to them at that time. The tradition of eating Chinese food on Christmas has since become a popular holiday tradition for many Jews in the United States.

- The testing was held at Forsyth Park interviewing a total of 12 people (6 per topic); we pre selected the topic and explained them that they need to read each article, at the end, a survey was given to them.





First Test Articles

Group B

We are a group of SCAD students working on a project about Information Evaluation. Please spare us THREE minutes to fill it out. All answers are anonymous and for research only.

1. How would you rate these articles on scale 1 to 5? (being 5 the most reliable)

	1	2	3	4	5
A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. How would you think about these news?

	True	False	I'm not sure
A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Which of the following channels do you actively get and share information?

<input type="checkbox"/> Facebook	<input type="checkbox"/> WhatsApp/iMessage
<input type="checkbox"/> Instagram	<input type="checkbox"/> Newspaper/News Site
<input type="checkbox"/> Twitter	<input type="checkbox"/> Magazine/eMagzine
<input type="checkbox"/> Snapchat	<input type="checkbox"/> Journal
<input type="checkbox"/> Youtube	<input type="checkbox"/> Email
<input type="checkbox"/> TV	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Radio	_____

4. One of these articles is a fake news, which one do you think it is?

(A) (B) (C)

Gender: _____ Age: _____

Level of Education: _____ Occupation: _____

About the articles:

1. What are your thoughts after knowing one of these articles is fake?
2. Do you care about the info that you read just now?
3. How did you evaluate which one is fake or not?
4. If you have the possibility to check what you read, would you do it? Which one? How?
5. Do you want to share any of these articles? Which one? With whom?

About Information:

1. How frequent do you proactively search for info? where?
2. What do you usually look for?
3. What else do you want to share about fake news/ Disinfo?

- This is the survey that the participants took: here we wanted to know if they can know which article they believed was true or fake, demographics and where do they get information from.

- Also, from the 12 participants, 8 were interviewed at the end of the survey to get their thoughts and opinions about fake news, misinformation and research.



COLLABORATED TEAM WORK

The two groups start working as **one** for more consistent and accurate results.



Redefined Focus Area

How people evaluate information

Targeting Different Articles





Section 2

Primary Research

2.1 Final Articles for Research

2.2 Survey Testing

2.3 Interview Round #1

2.4 Interview Round #2

2.4.1 Reminders for Interview

2.4.2 General Outcomes



2.1

Articles for Interview



Article #01

Exercise

EMOTIONAL ARTICLE

“Not feeling sore means you didn't get a good workout.”

Truth: While soreness and workout intensity are sometimes connected, how tired your muscles feel isn't always a good indicator of a solid sweat session. "Being sore doesn't necessarily mean it was a great workout—it just means that a significant amount of stress was applied to the tissue," says exercise physiologist and trainer Pete McCall, M.S., C.S.C.S., host of the All.

About Fitness podcast. "You can have a great workout and not be sore the next day," he says. Proper recovery will help prevent achy muscles. "Refuel within the first 30 to 45 minutes post-exercise, stay hydrated, and get enough sleep—all of these things can help boost recovery and minimize soreness."



Article #02

TRUE ARTICLE

Parachute

“When jumping out of a plane, a parachute is no more effective than an empty backpack”

Research published in a major medical journal concludes that a parachute is no more effective than an empty backpack at protecting you from harm if you have to jump from an aircraft.

The gold standard for medical research is a study that randomly assigns volunteers to try an intervention and it proved true.

In all, 23 people agreed to be randomly given either a backpack or a parachute and then to jump from a biplane on Martha's Vineyard in Massachusetts or from a helicopter in Michigan.

Oh, there's one important detail here. The drop in the study was about 2 feet total, because the biplane and helicopter were parked.



Article #03 (Deleted) Tongue

FAKE ARTICLE

“Tongue Is Mapped Into Four Areas of Taste”

What is known is that there are at least five basic tastes: sweet, sour, salty, bitter and the most recently discovered, umami. This last flavor, which means “savory” in Japanese, can be detected in miso, soy sauce and other Asian foods, particularly those that contain monosodium glutamate. And scientists suspect that there are receptors for other flavors as well.

In a study published in the journal Nature in 2006, a team of scientists reported that receptors for the basic tastes are found in distinct cells and that these cells are not localized but spread throughout the tongue. That said, other studies suggest that some parts may be more sensitive to certain flavors and that there may be differences in the way men and women detect sour, salty and bitter flavors.

NOTE:

After testing all 3 articles, we came to the conclusion that we did not need a fake article to interpret if people had critical thinking. Further, we were not trying to trick people to believe a fake article, but we were trying to assess how people were reacting and responding to any article regarding if it was fake or real.



2.2 Survey Testing



Testing

First Interview

1. Age: _____

2. Gender:

- a. Female
- b. Male
- c. Prefer not to say
- d. Other: _____

3. Occupation: _____

4. Which of the following categories best describes your employment status?

- a. Entrepreneur (self-employed)
- b. Employed, working 40 or more hours per week
- c. Employed, working 1-39 hours per week
- d. Not employed, looking for work
- e. Not employed, NOT looking for work
- f. Retired
- g. Disabled, not able to work

5. What is the highest level education that you have completed?

- a. Did not attend school
- b. Less than high school
- c. Graduate from high school or equivalent (e.g. GED)
- d. College
- e. Graduate from College
- f. Some college graduate
- g. Complete graduate school

6. What year did you complete your last degree?

7. Do you believe this sentence?

- a. I do
- b. I do not
- c. I cannot now, as there is less information

The placement of question is confusing to interviewees.



Testing

Second Interview

1. Do you feel connected to the text you just read?
2. Would you like to read the whole article or will you pass through?
3. Would you like to forward this article? (Why? With whom?)
4. How frequently do you search info? Where?
5. What do you usually look for?
6. What else do you want to share about fake news/ Disinformation?

The order of the question
does not make sense.



2.3

Interview Round #1



Round #1

First Interview

1. Do you believe this sentence?

- a. I do
- b. I do slightly
- c. I do not slightly
- d. I do not

2. How do you decide its true or false?

Demographic:

1. Age: _____

2. Gender:

- a. Female
- b. Male
- c. Prefer not to say
- d. Other: _____

3. Occupation: _____

4. Which of the following categories best describes your employment status?

- a. Entrepreneur (self-employed)
- b. Employed, working 40 or more hours per week
- c. Employed, working 1-39 hours per week
- d. Not employed, looking for work
- e. Not employed, NOT looking for work
- f. Retired
- g. Disabled, not able to work

5. What is the highest level of school you have completed or the highest degree you have received?

- a. No schooling completed
- b. Nursery school to 8th grade
- c. Some high school, no diploma
- d. High school graduate, diploma or the equivalent (e.g GED)
- e. Some college credit, no degree
- f. Trade/technical/vocational training
- g. Associate degree
- h. Bachelor's degree
- i. Master's degree
- j. Professional degree
- k. Doctorate degree

6. What year did you complete your last degree? **And** in what major? _____



Round #1


Second Interview

1. Do you feel connected to the text you just read?
2. Would you like to read the whole article or will you pass through?
3. Would you like to forward this article? (Why? With whom?)
4. **What do you usually look for?**
5. **How frequently do you search info? Where?**
6. What else do you want to share about fake news/ Disinformation?



Previous Interpretation

1. People above the age of 60 rely on information they find on google because google is considered as a source in itself for reliable information.
2. Google is a free search engine which is why it is preferred as a direct source to information, rather than understanding the sources of the information within it as a separate entity.
3. People who are employed in a field that requires critical thinking but have not been in touch with academics had given more critical answer than other.
4. Information that directly (knowledge or emotionally) concerned an individual was believed more easily without asking for the truthfulness of the source.

OVERSIGHT  **We ignored the differences between gender and age, which lead to misinterpretation of data.**
Eg. different amounts of female and male



2.4

Interview Round #2

(Before, during and after interviews)



Round #2

First Interview

1. Do you believe this sentence?

- a. I do
- b. I do slightly
- c. I do not slightly
- d. I do not

2. How do you decide its true or false?

Demographics:

1. Age: _____

2. Gender:

- a. Female
- b. Male
- c. Prefer not to say
- d. Other: _____

3. Occupation: _____

4. Which of the following categories best describes your employment status?

- a. Entrepreneur (self-employed)
- b. Employed, working 40 or more hours per week
- c. Employed, working 1-39 hours per week
- d. Not employed, looking for work
- e. Not employed, NOT looking for work
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5. What is the highest level of school you have completed or the highest degree you have received?

- a. No schooling completed
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- c. Some high school, no diploma
- d. High school graduate, diploma or the equivalent (e.g GED)
- e. Some college credit, no degree
- f. Trade/technical/vocational training
- g. Associate degree
- h. Bachelor's degree
- i. Master's degree
- j. Professional degree
- k. Doctorate degree

6. What year did you complete your last degree? And in what major? _____



Round #2

Second Interview

1. Do you feel emotionally connected to this text? Yes/No
2. **How confident are you to assess the accuracy of the news present above?**
Very confident Neutral Not confident at all
1 2 3 4 5
3. Would you like to read the whole article or will you pass through? Read/Pass
4. Would you like to forward this article? (Why? With whom?)
5. What information do you usually search for?
(eg. educational, personal, informational)
6. **How do you decide which link is most relevant to the information you searched on Google search engine?**
7. What else do you want to share about fake news/ Disinformation?



2.4.1

Reminders For Interviewers

(Takeaways and counting)



Reminder for the Interviewer- Before doing the interview

Number & Gender

- Each member of the team will be interviewing 4 people (16 in total): 2 men and 2 female.
- For each article there must be 4 men and 4 female participants.
- Each member will ask questions in the same order and record data exactly as given by the interviewee.

Reminder for the Interviewer- During the actual interview session

Asking questions

- First the participants will be reading only the article's title. First Interview (survey) is given. After that, participants will reading the rest of the text; Second Interview is given.
- Each member will give the same questions, without leading the participant to answer in certain way or another.
- Interviews will be recorded (later transcribed).



Reminder - After

Reminder Criteria to categorize Critical Thinking

From the First interview answers, each participant will be assigned into one of the following categories:

- A. **(C & NA)** The individual has critical answer with having no degree currently/recently.
- B. **(NC & A)** The individual has no critical answer but is in touch with academics currently/ recently.
- C. **(C & A)** The individual has critical answer and is in touch with academics currently/recently.
- D. **(NC & NA)** The individual has no critical answer and no degree currently/recently.

Critical answer = provide explanation using facts or experience



2.4.2

Data Analysis

Raw Data: https://docs.google.com/spreadsheets/d/1oHrVb_rriNRDhkLwpWiDtxU7ZI4gyLMLuj3f14wLzNg/edit?usp=sharing

“Do they Believe” Verse “Gender”

Female:

- 3 - I do not
- 0 - I do not slightly
- 3 - I do slightly
- 2 - I do

Male:

- 6 - I do not
- 0 - I do not slightly
- 1 - I do slightly
- 1 - I Do

“Do they Believe” Verse “Age”

21-30

- 3 - I do not
- 0 - I do not slightly
- 2 - I do slightly
- 2 - I do

31-40

- 2 - I do not
- 0 - I do not slightly
- 1 - I do slightly
- 0 - I do

41-50

- 1 - I do not
- 0 - I do not slightly
- 0 - I do slightly
- 0 - I do

60 and up

- 1 - I do not
- 0 - I do not slightly
- 0 - I do slightly
- 0 - I do

51-60

- 2 - I do not
- 0 - I do not slightly
- 1 - I do slightly
- 1 - I do



Do you believe it?	Age	Gender
I do not	23	Male
I do not	28	Female
I do not	31	Male
I do not	32	Female
I do not	42	Male
I do not	55	Male
I do not	63	Male
I do not	26	Female
I do not	56	Male
I do slightly	28	Female
I do slightly	29	Male
I do slightly	39	Female
I do slightly	52	Female
I do	24	Female
I do	25	Female
I do	55	Male



How do you decide it's true or false?

Parachute

"If it is a parachute, it's gonna work. How I'm gonna decide that is true or false? Well is under... (laughs) well is no way to determine if its true or false unless to get the actual parachute"

"I believe this is false because i have been skydiving before and that seems unrealistic. Also, the sentence does not seem to be accurate based on science courses i have taken in the past"

"Out of experience, I was in the air force."

Exercise

"It's how I feel whenever I do exercise. If I don't feel pain, it feels I did not do enough"

"I work out as a hobby and train people on weekends."

"I don't like working out"

"Don't associate feeling sore and good workout together."



By Category

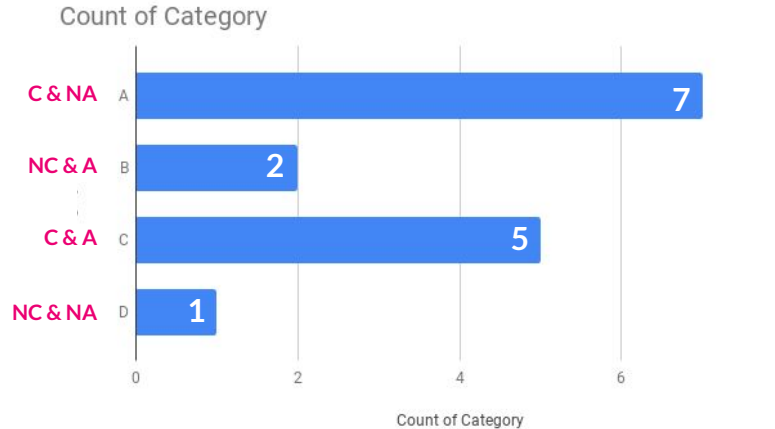
16 Responses

8 Female:

- 4 for Parachute
- 4 for Exercise

8 Male:

- 4 for Parachute
- 4 for Exercise



- A. **(C & NA)** The individual has critical answer with having no degree currently/recently.
- B. **(NC & A)** The individual has no critical answer but is in touch with academics currently/ recently.
- C. **(C & A)** The individual has critical answer and is in touch with academics currently/recently.
- D. **(NC & NA)** The individual has no critical answer and no degree currently/recently.



Occupation vs Critical Answer

Category : A (C & NA)

- Executive Director
- Salesman / Manager
- Recruiter
- Uber Driver
- Accountant
- Director of Maintenance

Category : C (C & A)

- Student
- Part-time job/student
- Student
- Professor
- Professor
- Retail/Sales

Category : B (NC & A)

- Student
- Barista / Bus School Monitor

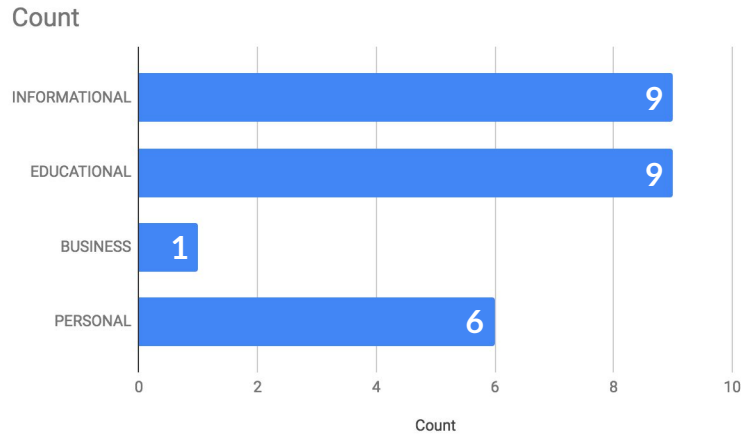
Category : D (NC & NA)

- Restaurant Manager



What do you usually look for?

(eg. educational, personal, informational)



Takeaway:

People tend to search information related to their **profession** and **occupation**.

Note: Participants were allowed to choose more than one, most participants choose a combination



How do you decide which link is most relevant to the information you searched on google search engine?

*“find the link includes more keywords of the information, and also check about the **source**”*

*“Depends on its connected to reliable source, like **university or research center**”*

5	Google
2	Google Scholar
2	Trust
2	University
2	Academic
2	Myself
1	Wikipedia
1	Statistics

Takeaway:

People trust on the information from **academic** source.



Category Comparison: A (C & NA)

A1

- 63
- Male
- **Executive Director**
- Bachelor's, 1976 (Electrical Engineer technology)
- Employed, working 40 hours or more per week

A2

- 28
- Female
- **Recruiter**
- Bachelor's Degree, 2012 (Accounting)
- Employed, working 40 hours or more per week

A3

- 42
- Male
- Uber Driver
- High School, 1996
- Entrepreneur (self-employed)

A4

- 55
- Male
- **Bed and Breakfast owner**
- Master's Degree, 1997 (Curriculum Design)
- Employed, working 40 hours or more per week

A5

- 31
- Male
- **Accountant**
- Master's Degree, 2012 (Accounting)
- Employed, working 40 hours or more per week

A6

- 29
- Male
- **Director of Maintenance**
- Bachelor's Degree, 2012 (Industry Design)
- Entrepreneur (self-employed)

A7

- 56
- Male
- **Recruiter**
- Associate Degree, 1983 (Electronics)
- Employed, working 40 hours or more per week

Takeaway:

Critical thinking is not related with age, but **experience** and **occupation**.



Category Comparison: B (NC & A)

B1

- 26
- Female
- **Barista**
- Grad from High School 2011
- Employed, working 40 hours or more per week

B2

- 32
- Female
- Student
- Bachelor 2013 (Sequential Art)
- Not employed, **looking for work**

Takeaway:

The kind of **profession in practice** also affects the critical thinking.



Category Comparison: C (C & A)

C1

- 24
- Female
- **Part Time Job**
- Bachelor 2017 (Interior Design)
- Employed, less than 40 hours per week

C2

- 25
- Female
- **Student**
- Bachelor 2018 (Architecture)
- Not employed, NOT looking for work

C3

- 55
- Male
- **Professor**
- Master 2000 (Visual Communication)
- Employed, working 40 hours or more per week

C4

- 23
- Male
- **Student**
- Bachelor 2017 (Marketing)
- Employed, less than 40 hours per week

C5

- 28
- Female
- **Student**
- Bachelor 2012 (Sociology)
- Employed, working 40 hours or more per week

C6

- 39
- Female
- **Professor**
- Master 2014 (International Business)
- Employed, working 40 hours or more per week

Takeaway: The **occupation/ profession** involves critical thinking.



Category Comparison: D (NC & NA)

D1

- 52
- Female
- **Restaurant Manager**
- Associate Degree 1988 (Business)
- Employed, working 40 hours or more per week

We need more participants in this category to make any conclusions



NEW Interpretation

People who have critical thinking and are not in touch with academics recently, tend to have critical thinking if they are **currently practicing a profession** that requires at minimum a Bachelor's Degree and working 40 + hours.



Refined Area of Interest

We are interested in people who do **not have critical thinking**
while being in touch **with or without** academics.



Section 3

Testing and Analyzing Information

3.1 Interview Round #3

3.2 Interview Round #4 & Gathering Instrumental data with SPSS

3.3 Flow chart development



3.1

Interview Round #3



Why We Need To Have Interview Round #3?

We realized that we needed **more significant instrumental data**.
We ran other interview to get answers that we could properly use
to draw instrumental data from.



Redefining the criteria for critical and non critical thinkers

Criteria Scale of Critical Thinking:

1. **Not critical at all**
2. **Critical** (answers in a way that relates to factual or experience) **-or-** (answers with “ I don't know, need more information”).
3. **Very Critical** (answers related to factual or experience **and** “need to know more information”).

An answer is critical on the below factors:

*** do not interview those who respond with absolutism***

Experience
Experience
First Person
I have, I used, I do
Facts
believe
make sense
artifacts

Article

Parachute

“When jumping out of a plane, a parachute is no more effective than an empty backpack”

Research published in a major medical journal concludes that a parachute is no more effective than an empty backpack at protecting you from harm if you have to jump from an aircraft.

The gold standard for medical research is a study that randomly assigns volunteers to try an intervention and it proved true.

In all, 23 people agreed to be randomly given either a backpack or a parachute and then to jump from a biplane on Martha's Vineyard in Massachusetts or from a helicopter in Michigan.

Oh, there's one important detail here. The drop in the study was about 2 feet total, because the biplane and helicopter were parked.



Round #3

First Interview

1. Do you believe this sentence?

- a. I do
- b. I do slightly
- c. I do not slightly
- d. I do not

2. How do you decide its true or false?

3. If you were to list three steps to research about the above topic, what would it be?

4. What is the highest level of school you have completed or the highest degree you have received?

- a. No schooling completed
- b. Nursery school to 8th grade
- c. Some high school, no diploma
- d. High school graduate, diploma or the equivalent (e.g GED)
- e. Some college credit, no degree
- f. Trade/technical/vocational training
- g. Associate degree
- h. Bachelor's degree
- i. Master's degree
- j. Professional degree
- k. Doctorate degree

5. What year did you complete your last degree? And in what major? _____



Round #3

Second Interview

Demographics:

1. Age: _____

2. Gender:

- a. Female
- b. Male
- c. Prefer not to say
- d. Other: _____

3. Occupation: _____

4. Which of the following categories best describes your employment status?

- a. Entrepreneur (self-employed)
- b. Employed, working 40 or more hours per week
- c. Employed, working 1-39 hours per week
- d. Not employed, looking for work
- e. Not employed, NOT looking for work
- f. Retired
- g. Disabled, not able to work

1. Do you feel emotionally connected to this text? Yes/No

2. How confident are you to assess the accuracy of the news present above?

Very confident Neutral Not confident at all

1 2 3 4 5

3. Would you like to read the whole article or will you pass through? Read/Pass

4. Would you like to forward this article? (Why? With whom?)

5. What information do you usually search for? (eg. educational, personal, informational)

6. How do you decide which link is most relevant to the information you searched on Google search engine?

7. What else do you want to share about fake news/ Disinformation?



**Defining the Stage A and B.
Motivating non-critical thinkers to be Critical**



Clustering Similar Answers



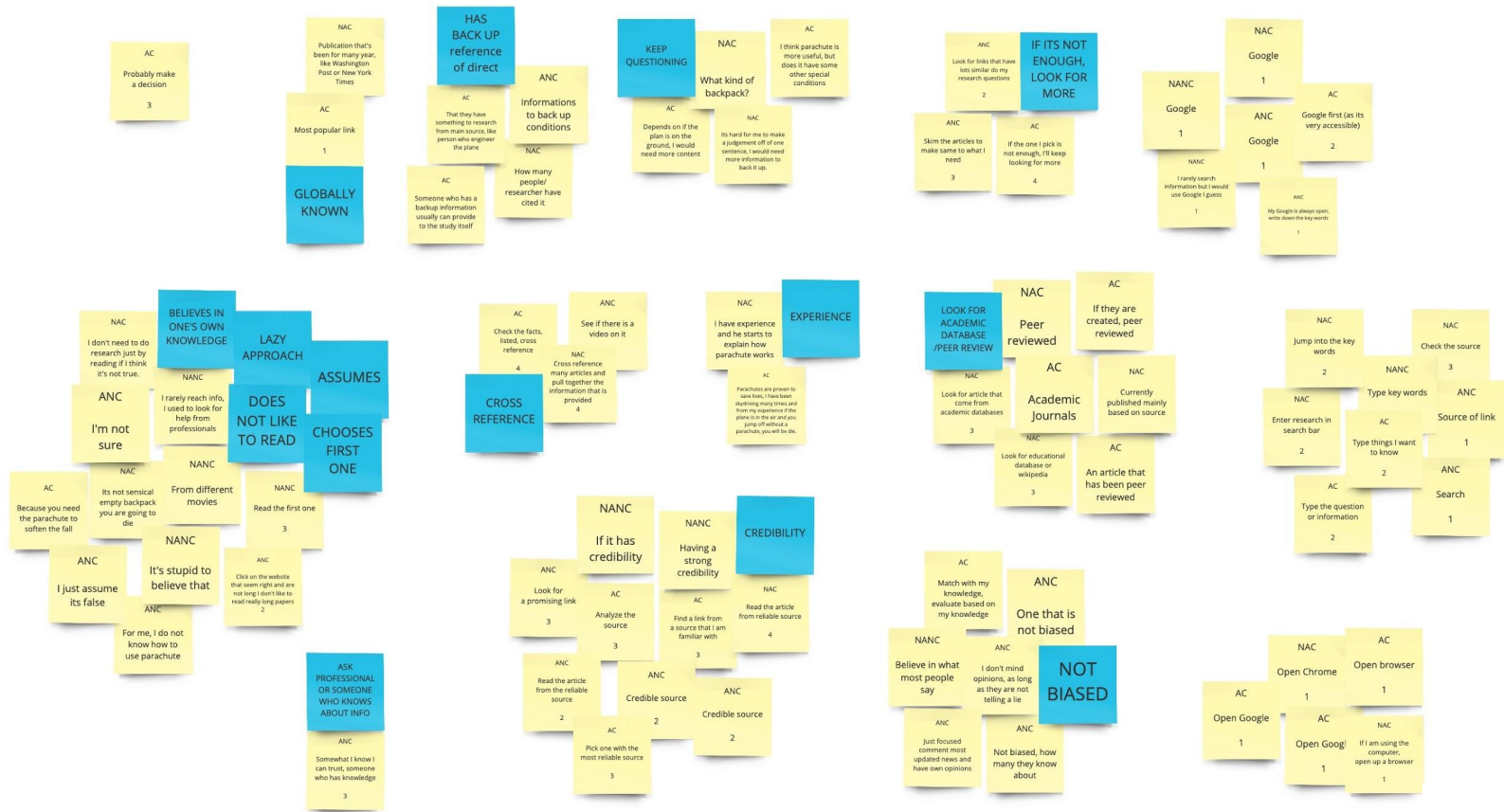


Clustering on Basis of Showing Critical Thinking





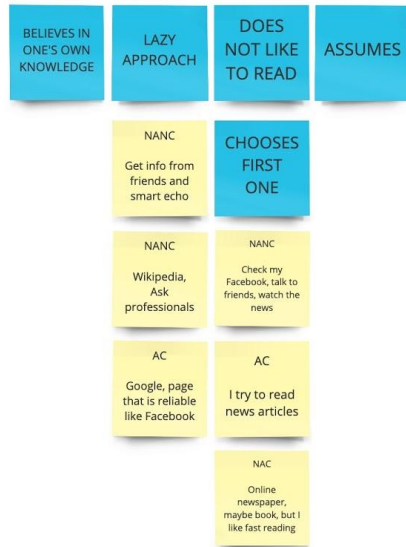
Naming the Category on What It Broadly Specifies



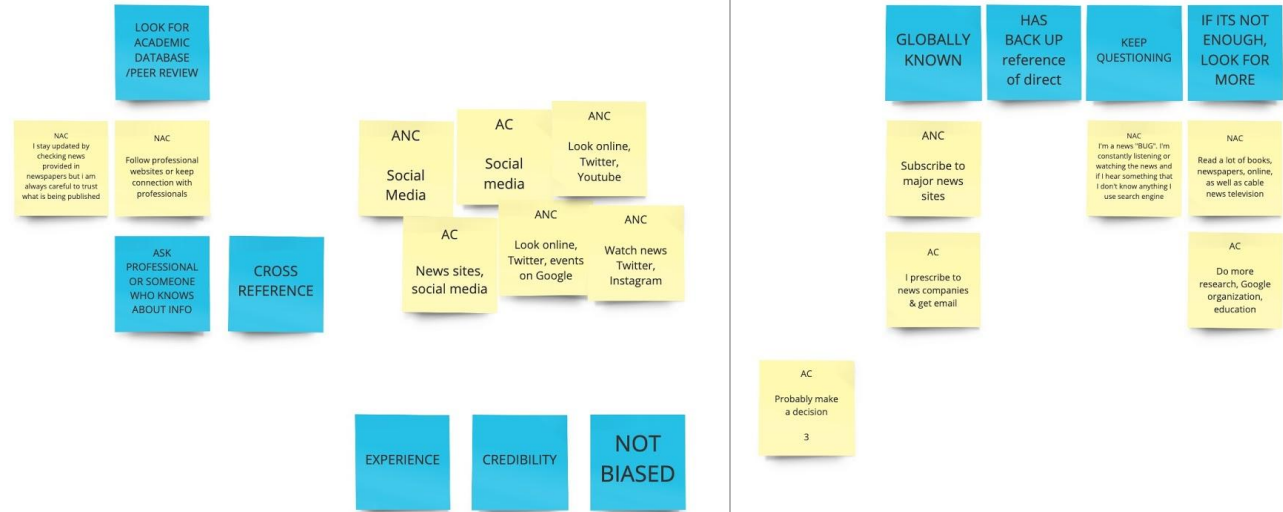


Placing According To Individual Critical Ability

Not Critical



Critical



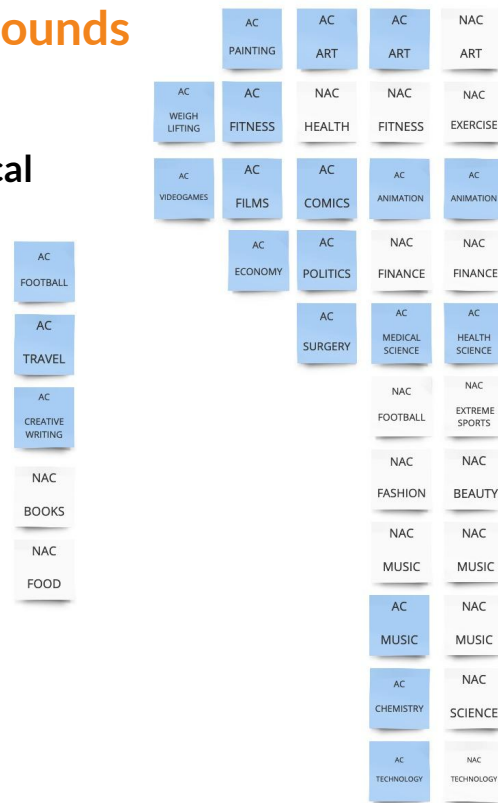


Listing The Individual Interest And Defining Common Grounds

Not Critical



Critical



OVERSIGHT 2

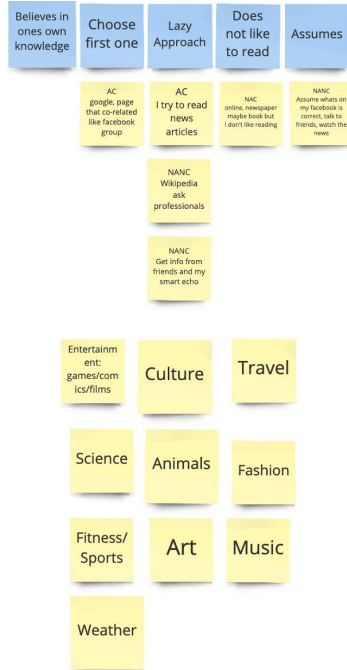
We unconsciously used our own bias to categorize the information.

Eg. film parks + entertainment

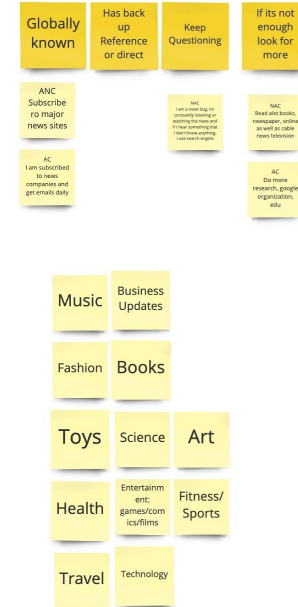


Excluding the **Overlapping** Interest In The Categories

Not Critical



Critical



OVERSIGHT **3** We ignore to measure the frequency of the interests (*instrumental data*).



Defining the **Common Interest**, that could be considered while building the bridge

Not Critical



Critical





Refined area of Interest

From our results, we established that most of the undergraduate students we interviewed did not display critical thinking skills. Therefore, we refined our area of interest specifically to **students at SCAD** in order to instill critical thinking within them.



3.2

Interview Round #4 & Gathering Instrumental data with SPSS *(People's reactions)*



Students Interviewed

Graduate and Undergraduate





Criteria #01

Based on questions:

1. When jumping out of a plane a parachute is no more effective than an empty backpack?
2. Do you believe it?
3. Why or why not?
4. Are you undergraduate or graduate student at SCAD?
5. What is your major?

Interview #	Visual contact	Do they believe?	Clear Y/N Answer	Time to answer	Ask to Repeat	I repeat unconsciously	Don't say much Laugh	Nervous	Nervous Smile	Eye brown frowning	Ask Questions	Kept Silence until we asked something	Provided their own thoughts	Education level	Major
Kathleen 0001	Staring at paper	No	No	-	Yes (paper)	-	No	No	No	Yes	Yes	No	Yes	LIC	Animation
Kathleen 0002	Staring at paper	No	Yes	11	Yes (paper)	-	Yes	Yes	Yes	No	No	Yes	No	LIC	Film
Kathleen 0003	Staring at interview	No	Yes	3	No	-	Yes	No	No	No	Yes	No	Yes	LIC	Game develop
Kathleen 0004	Staring at interview	No	No	10	No	Yes	Yes	No	Yes	No	No	No	Yes	G	Animation
Kathleen 0005	Staring at interview	No	No	23	No	Yes	Yes	Yes	Yes	No	No	No	Yes	LIC	Animation
Kathleen 0006A	Staring at the Interview	No	No	12	Yes	-	Yes	No	Yes	No	No	No	Yes	LIC	Film
Kathleen 0006B	Staring at the floor	No	No	20	Yes	-	Yes	No	Yes	No	No	Yes	Yes	LIC	Animation
Kathleen 0007A	Staring at the Interview	No	No	10	No	-	Yes	No	No	No	No	No	Yes	LIC	Film
Kathleen 0007B	Staring at the Interview	No	Yes	11	No	-	Yes	Yes	Yes	No	No	Yes	Yes	LIC	Preforming Arts
Kathleen 0008A	Staring at floor	No	Yes	12	Yes	-	No	No	Yes	Yes	Yes	No	Yes	LIC	Sound
Kathleen 0008B	Staring at interview	No	Yes	14	Yes	-	No	Yes	Yes	Yes	Yes	No	Yes	LIC	Sound
Kathleen 0009A	Staring at interview	No	Yes	23	Yes	-	No	Yes	Yes	No	Yes	No	Yes	G	CMCOT
Kathleen 0009B	Staring at interview	No	Yes	32	Yes	-	No	Yes	Yes	Yes	Yes	No	Yes	G	CMCOT
Kathleen 0009C	Staring at interview	No	Yes	23	Yes	-	Yes	No	Yes	No	No	Yes	No	G	CMCOT
Kathleen 0009D	Staring at interview	No	Yes	33	Yes	-	No	No	No	Yes	No	No	Yes	G	CMCOT
Kathleen 0009E	Staring at interview	No	Yes	5	No	-	Yes	Yes	Yes	Yes	No	No	Yes	LIC	Game Design
Kathleen 0009A	Staring at Floor	No	Yes	13	No	-	Yes	No	Yes	No	Yes	No	Yes	LIC	Industrial Design
Kathleen 0009B	Staring at interview	No	No	14	No	-	Yes	No	Yes	No	Yes	No	Yes	LIC	Industrial Design
Kathleen 0009A	Staring at interview	No	No	24	No	Yes	No	Yes	Yes	Yes	No	Yes	No	G	CMCOT
Kathleen 0009B	Staring at interview	No	Yes	31	No	Yes	Yes	No	Yes	Yes	No	Yes	No	G	Service Design
Kathleen 0009C	Staring at interview	No	Yes	32	No	Yes	No	No	Yes	Yes	No	Yes	No	G	Industrial Design and Furniture

Criteria #02

Based on reactions:

- Visual contact
- Do they believe?
- Clear Y/N Answer
- Time to answer
- Ask to Repeat
- I repeat unconsciously
- Don't say much
- Nervous Laugh
- Nervous Smile
- Eye brown frowning
- Ask Question
- Kept Silence until we asked something
- Provided their own thoughts
- Education level
- Major



Takeaways

Based on reactions

Q6= 1/Q5

- Q6 interviewer repeats unconsciously
- Q5 Ask to repeat

Q11= 1/Q7

- Q11 ask questions
- Q7 Talk less

Q13= 1/Q12

- Q13 provided own thoughts
- Q12 kept silent

After looking at the data from the SPSS, we found that **V23** had little correlation to the others.

		Correlations																						
		V09	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	V29		
Spearman's rho	Correlation Coefficient	1.000	-.314	.730**	.136	.245	-.177	.056	-.136	.642*	-.436	.736**	-.054	.670*	.136	.248	-.335	-.163	-.054	.363	.322	-.136		
	Sig. (2-tailed)		.320	.006	.673	.442	.583	.863	.673	.024	.157	.006	.866	.017	.673	.437	.287	.612	.866	.246	.307	.673		
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V09	Correlation Coefficient		1.000																					
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V10	Correlation Coefficient			1.000																				
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V11	Correlation Coefficient				1.000																			
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V12	Correlation Coefficient					1.000																		
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V13	Correlation Coefficient						1.000																	
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V14	Correlation Coefficient							1.000																
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V15	Correlation Coefficient								1.000															
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V16	Correlation Coefficient									1.000														
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V17	Correlation Coefficient										1.000													
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V18	Correlation Coefficient											1.000												
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V19	Correlation Coefficient												1.000											
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V20	Correlation Coefficient													1.000										
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V21	Correlation Coefficient														1.000									
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V22	Correlation Coefficient															1.000								
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V23	Correlation Coefficient																1.000							
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V24	Correlation Coefficient																	1.000						
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V25	Correlation Coefficient																		1.000					
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V26	Correlation Coefficient																			1.000				
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V27	Correlation Coefficient																				1.000			
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V28	Correlation Coefficient																					1.000		
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
V29	Correlation Coefficient																							
	Sig. (2-tailed)																							
	N	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		

*. Correlation is significant at the 0.01 level (2-tailed).
 *. Correlation is significant at the 0.05 level (2-tailed).



V23

- V23 showed strong critical thinking. He was the only person we interviewed who mentioned that he needed more information to make a conclusion and provide an opinion on the statement we had asked.
- Some other characteristics that V23 showed were he **paused before initially answering** and **took time** to understand the statement, he **asked us questions** about the statement we offered, and showed **no nervous laughter**.





3.3

Flow chart development





Section 4

Designing and Developing a Tool

- 4.1 Inspiration
- 4.2 Prototyping and testing
- 4.3 Final Design



4.1

Inspiration



Campaign Monitor

PREFLIGHT CHECKLIST FOR EMAIL CAMPAIGNS.

USE THIS CHECKLIST TO ENSURE THAT YOUR EMAIL IS AWESOME BEFORE YOU HIT SEND.

- THE DETAILS**
 - Subject line:** Check for typos and personalization.
 - Preheader text:** Have you updated it? Check for typos.
 - Footer:** Have you updated if necessary?
 - Sender address:** Always include the physical address of your business.
 - Permission reminder:** Have you updated as needed?
 - Unsubscribe link:** You must always include this.
 - Social icons:** Are they linked to the correct social networks?
- THE CONTENT**
 - Body copy:** Check for typos and readability.
 - Images:** Are they properly linked? Have you added ALT text?
 - Background images:** Have you added a fallback color?
 - Headlines:** Are they properly linked?
 - CTA buttons:** Are they properly linked?
 - Personalization:** Do you have a fallback in place?
 - Dynamic content:** Who should see it?
- LISTS**
 - Suppressions:** Do you need to suppress any lists?
 - Exclusions:** Do you need to exclude any portion of your list?
 - Data:** Does your subscriber list have all of the fields you need?
- TESTING**
 - Inbox preview:** Have you sent yourself a test email?
 - Full inbox test:** Have you tested all email clients?
 - A/B testing:** Are you A/B testing this campaign?
- OTHER**
 - Notify team:** Notify appropriate teams like support or sales. Send them a link to the campaign, let them know who the audience is, and tell them when it will send.
- SEND**
 - Schedule:** Schedule your campaign to send immediately or in the future.
- AFTER THE SEND**
 - Analytics:** See how your campaign performed.



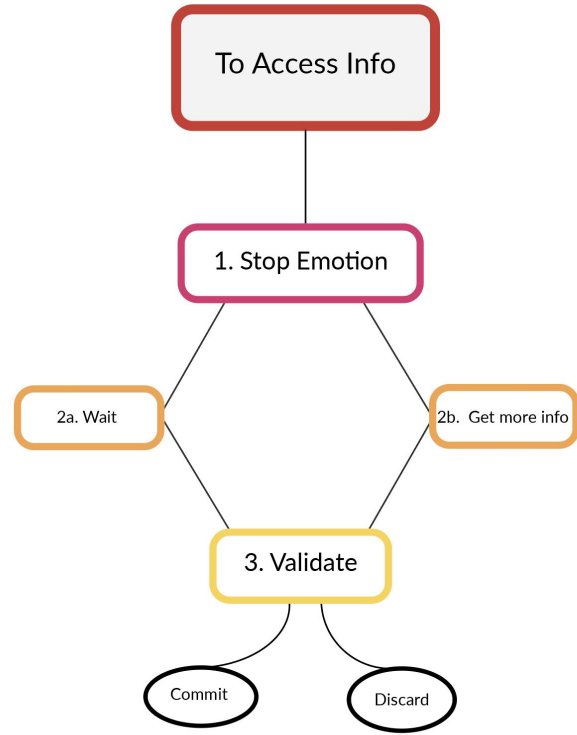
4.2

Prototyping & Testing



Prototype #1

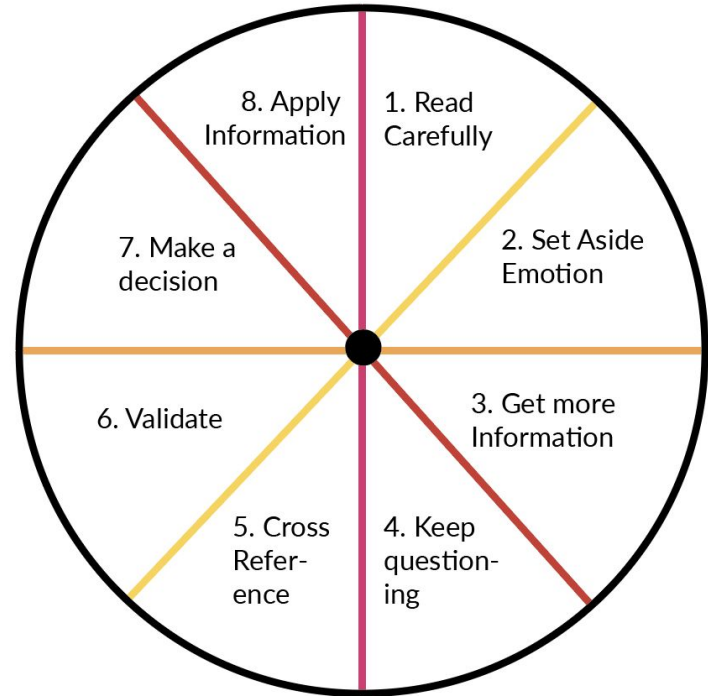
The first prototype consisted of a flow chart that listed steps to follow. When we tested it, students **struggled at stage 2** (were they had a hard time understand what was stated by to wait or get more info). They also **didn't understand the meaning of what commit or discard was** in regards to reading an article.





Prototype #2

The 2nd prototype consisted of a circular chart that students could interact with. When we tested it, students **struggled with the number of steps**. They believed some of them were **repetitive and unnecessary**.





Prototype #3

The 3rd prototype consisted of a **simple list** that provided 4 steps to follow. Because we are **targeting SCAD students**, we used the acronym to help students remember the order to follow . When we tested it, students found the steps **easy to follow although they felt it was not aesthetically pleasing**.

STOP

Read/Listen/Think carefully and set aside emotion

CONSIDER

Other alternatives and get more information

ASSESS

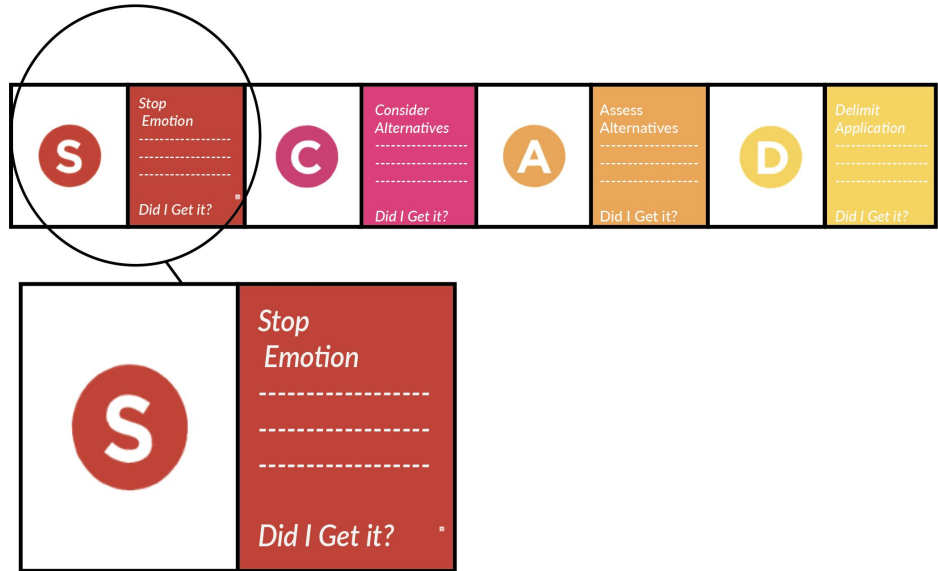
Cross reference sources and access alternatives

DELIMIT

Define limits and Validate



Prototype #4



The 4th prototype consisted of the same steps as prototype 3, yet we designed a tool that was **vertical and could be folded up**. When we tested it, students **struggled with the amount of folds** it has and stated it had made it **complicated**. Also, had a **hard time understanding where to begin and end**.



4.3

Final Design

 **Bee**Pro

The logo for 'BeePro' features a stylized bee icon with yellow and black stripes and white wings, perched on the top left of the letter 'B'. The word 'Bee' is rendered in a bold, black, sans-serif font, while 'Pro' is in a yellow, sans-serif font.



We went forward with the **SCAD color** theme from our **ID's** and portions of the website. We tested the colors through some prototypes and got good feedback. Students **liked working with a tool with this color theme.**





We went forward with both a **sticker and foldable tool** which list the steps we compiled from our research.

The foldable tool comes in two sizes, one 8"x8" and one 3"x3". Both the sticker and foldable tool **display our facebook page** that students can go to for more information.

Foldable Tool 3"x3" & 8"x8"

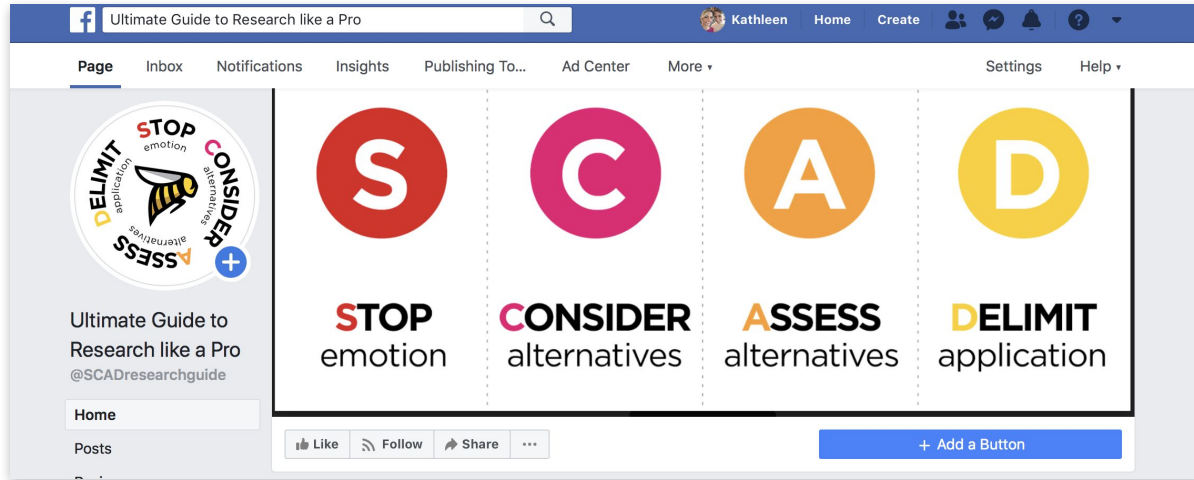
Sticker
2"x2"



Front Side



Back Side



We created a **facebook page** that provides **more information and explanation** about our project and the tool we created. The facebook page allows us to have a digital space to explain and display our project.

BeePro

Application





Section 5

Conclusions & Reflections



Learning from Oversight

- OVERSIGHT **1** We did not understand that the differences between gender and age could lead to misinterpretation of data.
Eg. different amounts of female and male
- OVERSIGHT **2** We unconsciously used our own **bias** to categorize the information.
Eg. *film parks + entertainment*
- OVERSIGHT **3** We ignore to measure the frequency of the interests (**instrumental data**).



Conclusion

Complex Adaptive Systems are everywhere around us, but they are organized and adaptable. Through our tool **BeePro**, we are able to understand the flow of information interpreted at different places around the individuals **space**. We are able to understand that the students interacting with our tool are the **agents** researching for different information. The spaces around them enable them to **copy** their peers and spread the tool for researching like a critical thinkers.

The **problem space** that we have defined is a part of a complex adaptive system, that we are trying to **manipulate through our tool in order to enhance the individual's capability to critically understand and unconsciously become competent towards reasoning information before believing or forwarding it.**