



Network Literacy Training Guide



Goal

To help participants learn about various basic network science concepts and the use of social networks for outreach and networking online.

Total Time

- 10-15 mins for onboarding video
- 20-25 mins for hands-on activities

Audience

We designed this for around 6-12 youth ages 14-21, but you can run it with more or less people.

Supplies

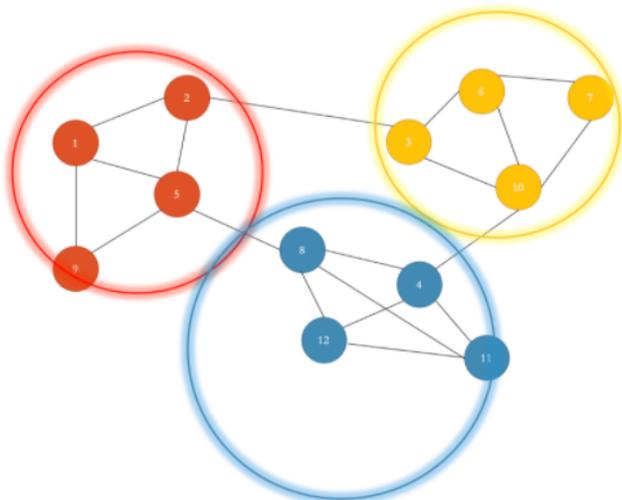
- A projector & laptop w/ internet
- Index cards (see Appendix)
- Glue
- 4 ft string of yarn (x16)
- 6ft string of yarn (x3)
- Network literacy cheat sheet (see Appendix B)
- Testing concepts for instructors (see Appendix C)

How to Run the Activities

Part 0: Before running the activity, please make sure to print out the materials in the Appendix A and paste them onto index cards to distribute to the participants during the activity. Additionally, print out copies of the "Network literacy cheat sheet" for participants to reference during the activities.

Part 1: Have the group watch the [network literacy video](#).

Part 2: Give each participant an index card explaining who they are and who they are connected to in the group. Have participants who are connected to each other hold a string of yarn together to represent an edge that connects them in the network.



This is how the network should look after all participants are connected together with the string.

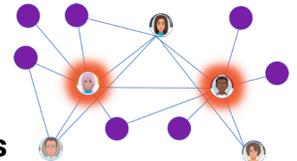
Glossary

Nodes

Networks have nodes and edges. Each of our profiles is a node.

Edges

The connections we make with other accounts, that is, other nodes, are represented by edges, which are the lines connecting nodes.

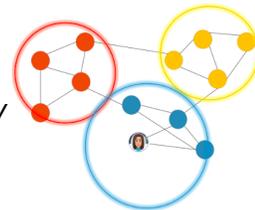


Influencers

Influencers allow other users to reach more people than they could on their own. If you remove influencers from the network, it can affect the shape of the network (i.e., how people are connected to each other)

Homophily

People who have common interests/ characteristics are grouped together.



Cascade Model



How an idea or message can spread or influence others - similar to dominoes falling.

Follower Hubs

Follower hubs are nodes that can deliver content to a larger audience than a normal user. However, they are less likely to adopt a new idea

Innovation Hubs

Innovation hubs are nodes that can deliver content to a smaller audience. However, they are more likely to adopt a new idea



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Part 3: Go through the following activities below:

Activity 1: Counting Connections

Description: Connections (i.e. edges) are the lines that connect nodes together in a network.

Learning Objective: Have participants successfully identify nodes and their number of connections.

[Facilitator:] How many nodes (social media profiles) is Node 'X' connected to?

[Answer:]

- Some answers include:
 - Node 1 is connected to three nodes (Nodes 2, 5, & 9)
 - Node 4 is connected to four nodes (Nodes 8, 10, 11, & 12)
- Some wrong answers include:
 - Node 1 is connected to two nodes. That's wrong because Node 1 has three edges (connections) to three different nodes.
 - Node 4 is connected to zero nodes. That's wrong because Node 4 has four edges (connections) to four different nodes.

[Facilitator:] Which nodes have the most connections?

[Answer:] Nodes 4, 5, & 10 have the most connections because each node is connected to four nodes.

Activity 2: Identifying Influencers

Description: Influencers are nodes that are particularly well-connected to other nodes in the network. They often have many edges that are connected to them.

Learning Objective: Have the participants successfully identify 'influencers' in the network.

First, let's remove Nodes 7 & 9 from the network

[Facilitator:] Node 7 & 9, please let go of your yarn and step away from the group.

[Facilitator:] How did the shape of the network change when Node 7 & 9 was removed?

[Answer:] The shape of the network barely changes because Node 7 & 9 did not have many connections before leaving the group.

Second, let's remove Nodes 3 & 5 from the network

[Facilitator:] Nodes 7 & 9, please come back into the group and hold the yarn that you previously let go. Now, Node 3 & 5, please let go of your yarn and step away from the group.

[Facilitator:] How did the shape of the network change when Nodes 3 & 5 was removed from the group? Do you think Node 3 & 5 are more 'influential' or Nodes 7 & 9?

[Answer:] The shape of the network changes significantly because Nodes 3 & 5 had many connections before leaving the group. Notice that Nodes 1, 2 & 9 are now separated from the rest of the network because Nodes 3 & 5 were removed.



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Activity 3: Understanding Diffusion

Description: Diffusion is the process in which information is able to spread within a network

Learning Objective: Participants should understand how information diffuses in networks and how the particular pattern of connections affects not only who gets the information, but how information spreads within the network as a whole

First, the facilitator will whisper a sentence into Node 9's ear

[Facilitator:] I will come up with a sentence and whisper into Node 9's ear. [Come up with a simple sentence and whisper into Node 9's ear]. Node 9, when you know what I whispered into your ear, please raise your hand. [Make sure Node 9 has his/her/their hand raised and for him/her/them to keep it raised]

Next, whenever the facilitator claps his/her/their hands, those with their hands raised will go and share the sentence with those who they are connected to who do not yet have their hand raised.

[Facilitator:] Whenever I clap once, I want those who have their hand raised to go to those who you are connected to who do not have their hand raised and whisper the sentence into their ear. When you hear the sentence, please raise your hand and keep it raised.

The facilitator will continue to clap until all participants have raised their hands.

[Facilitator:] How many claps did it take for everyone to raise their hands?

[Answer:] It should take 5 claps for everyone to raise their hand

Now, have everyone lower their hands and have them do this again but starting with Node 8.

[Facilitator:] How many claps did it take for everyone to raise their hands?

[Answer:] It should take 3 claps for everyone to raise their hand

[Facilitator:] As we can see, it matters which node started the diffusion of messages. When I whispered the message to Node 8, it took only three claps for everyone to hear the message compared to the five claps when I started the message at Node 9. The reason is because Node 8 is closer to every other node when compared to Node 9. So where the nodes are connected in the network is very important.



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Activity 4: Identifying Sub-Communities & Bridges

Description: Sub-communities are groups of people in the whole network that are close to each other and have many connections among each other. Usually sub-groups share common interests and/or characteristics and are close to each other. Bridge nodes are nodes who have connections to other sub-communities and connect sub-communities together.

Learning Objective: Participants should be able to identify and understand 'sub-communities' within a network and understand the importance of 'bridge nodes' within those 'sub-communities.'

Have participants identify the sub-communities

[Facilitator:] Now we're going to learn about sub-communities. Sub-communities are groups of nodes in the network that are close to each other and have many connections among one another. I want you all to identify the sub-communities in the network. [Hint: there are three]

[Answer:] Nodes 1, 2, 5, & 9 are a sub-community. Nodes 3, 6, 7, & 10 are a sub-community. Nodes 4, 8, 11, & 12 are a sub-community. These are sub-communities because they are nodes that are close to each other and share connections within that group.

Have participants identify the bridges

[Facilitator:] Node 12 has an extra ticket to a movie. Nodes 8, 4, & 11 [have them raise their hands] have not seen this movie, but because they are close to Node 12, they have heard how amazing it is! Node 12 has an extra ticket to the movie that he/she/they wants to give to a friend for free. Node 12 hopes that by giving this ticket to one of his/her/their connections, it would make it so that more people who have not heard about the movie would learn about how amazing it is. Who do you think he/she/they should give the ticket to? Why? Node 11, 4, or 8?

[Answer:] If Node 12 gives it to Node 8 or 4, they are also more likely to talk about it with their friends who are outside of this group! In this case, Nodes 8 and 4 are bridges between their sub-community and other sub-communities. 'Bridge nodes' are important because they allow information to be reached to other sub-communities that normally could not be reached before.



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Activity 5: Understanding Node Attitudes & Characteristics

Description: Although the position and connection of nodes is important, the characteristics and communication level of a person also influences the likelihood of information being passed from one person to another.

Learning Objective: Participants should understand other factors aside from a node's connections and position that influences the diffusion of information across a network.

Have participants identify the best node to pick based on the node's characteristics

[Facilitator:] Node 9 has one extra ticket to an event. His/her/their goal is to reach people who have not heard of this event. He/she/they knows that both Nodes 1 and 5 already know of the movie and have tickets. But Node 9 doesn't know anyone else to give the ticket to. Node 9 decides to ask either Node 1 or 5 to give this ticket to one of his/her/their friends and encourage the friend to come to the movie. However, based on past experience, Node 9 knows that Node 5 is not good at communicating and will forget to give the ticket to someone else. Whom should Node 9 give his/her/their ticket to in order to reach new people outside his/her/their sub-community? Why?

[Answer:] It is most likely best to give the ticket to Node 5 because, not only is he/she/they a 'bridge' node, but he/she/they also exhibits characteristics and attitudes where he/she/they would be more willing to share this information with his/her/their friends.

In this case, we want to point out that it's not only the position of the nodes in the network that matters. For example, how many followers they have and how often they communicate with them also matters.

Activity 6: Collective Outreach

Description: Rather than sharing one information to the next, multiple people can share information with the same person in order to increase the likelihood of them then sharing that information with their connections.

Learning Objective: Participants should understand how to identify mutual connections and utilize these connections to their advantage when sharing information.

Have participants identify the best node to pick based on the node's characteristics

[Facilitator:] Now imagine that Nodes 9, 1, and 2 are all working for a marketing agency for a clothing brand. They know that Node 5 is very influential and knows a lot of people. Nodes 9, 1, and 2 would want their clothing brand to reach. However, they know that Node 5 isn't the kind of person to tell others of the latest fashion trends unless he/she/they hears about the clothing brand from multiple people. What do you think Nodes 9, 1, and 2 can do in this situation? [Hint: Research has shown that when someone sees a content that is shared by more than one of their friends on social media, they are more likely to also share it!]

[Answer:] Nodes 9, 1, and 2 are all friends with Node 5! In this case, instead of waiting for one person to talk to 5, maybe all three members should reach out to node 5 and tell him/her/them about their fashionable clothes.



Appendix A

Node 1	Node 2
You are connected to: Nodes 2, 5, & 9	You are connected to: Nodes 1, 5, & 3
Node 3	Node 4
You are connected to: Nodes 2, 6, & 10	You are connected to: Nodes 8, 12, 10, & 11
Node 5	Node 6
You are connected to: Nodes 1, 2, 9, & 8	You are connected to: Nodes 3, 10, & 7
Node 7	Node 8
You are connected to: Nodes 6 & 10	You are connected to: Nodes 5, 4, & 12
Node 9	Node 10
You are connected to: Nodes 1 & 5	You are connected to: Nodes 3, 4, 6, & 7
Node 11	Node 12
You are connected to: Nodes 4 & 12	You are connected to: Nodes 4, 8, & 11



Appendix B

Network Literacy Training Cheat Sheet

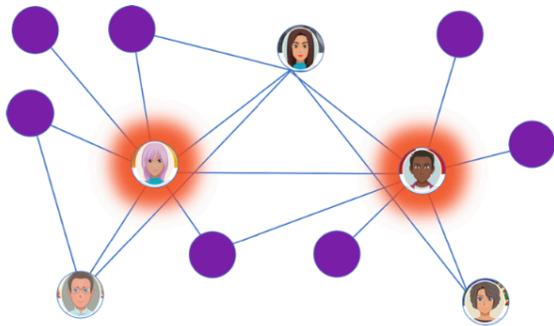
What are **Nodes**?

Networks have nodes and edges. Each of our profiles is a node.



What are **Edges**?

The connections we make with other social media accounts, that is, other nodes, are represented by edges, which are the lines connecting nodes.

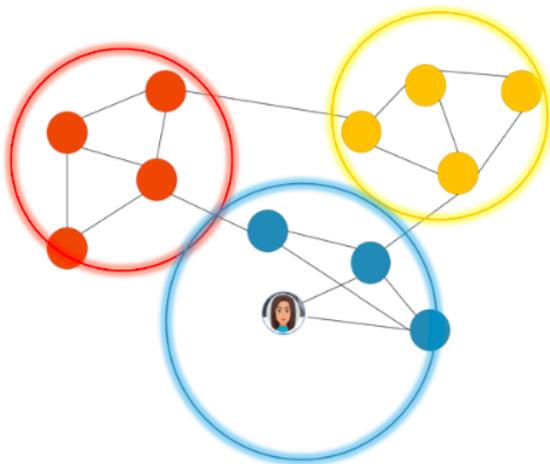


Who are **Influencers**?

Influencers allow other users to reach more people than they could on their own. If you remove influencers from the network, it can affect the shape of the network (i.e. how people are connected to each other)

What is a **Cascade Model**?

*How an **idea or message can spread** or influence others - similar to dominoes falling.*



What does **Homophily** mean?

People who have common interests/ characteristics are grouped together

What are **Innovation Hubs**?

*Innovation Hubs are nodes that can deliver content to a **smaller audience**. However, they are **more likely to adopt** a new idea*

What are **Follower Hubs**?

*Follower Hubs are nodes that can deliver content to a **larger audience** than a normal user. However, they are **less likely to adopt** a new idea*

How do you **create content** on social media?

It's important to learn how to create content on social media. For example, one research shows that more positive messages tend to diffuse or move more easily throughout than a negative one.



Appendix C

What is an edge?

- Edges are the same as nodes
- Edges refer to how much influence has
- Edges are the connections between nodes
- Edges refer to the message a person creates

What factors can affect the behavior of people in a network? (Mark all that apply)

- Structure
- Content of messages relayed
- Attributes of nodes
- The speed of the internet connection

What is a cascade model? (Mark all that apply)

- It describes how nodes can relay messages to the nodes close to them
- It describes how messages are diffused in a network
- It describes how nodes are connected to each other
- It describes waterfalls

Who are potential influencers in a network? (Mark all that apply)

- People who connect a lot of people to each other
- People who would not change the shape of a network if they were in the network
- People who have the least number of followers
- Celebrities

Name: _____

Date: _____