HOW TO USE THIS SLIDE-DECK

The slides contain relevant content for your own Co-Creating Our City project. They are provided for informational purposes, illustrating the five stages of the citizen science process, and may be used as a starting point for your own project.

Please adapt and add to these slides to suit your project by adding your own material, examples, and results from your Co-Creating Our City research. You should also consider rearranging slides as appropriate for the flow of your project.

INTRODUCTION

CO-CREATING OUR CITY

Before getting started with the research, consider providing your co-researchers with an introduction to the project.

The following slides show the starting point for Co-Creating Our City and cover the basics of citizen science.

To adapt these to your own Co-Creating Our City project, consider adding an introduction to your team and a timeline of your project.

HOW TO ADDRESS THE MISMATCH BETWEEN WHAT YOUNG PEOPLE SEEK OUT AND WHAT CITIES CAN OFFER?

Together, young people and city decision-makers generate insights into and concrete proposals for their cities to establish vibrant communities and solutions for next-level youth engagement.

A MISMATCH?

Young People

- Often lack influence in government
- Are engaged on an issue-basis
- Seek out project-based opportunities
- Use online platforms to express their ideas

Cities

- Want to hear young people’s ideas for vibrant communities
- Keen to engage, especially with underrepresented young people
- Sometimes lack efficient ways to engage with young residents

YOUR PROJECT

This collaborative project uses a novel citizen science approach to address the mismatch between opportunities for exchange offered in cities and what young people seek out in terms of engagement to realize their ideas of flourishing communities.

The project sees groups of selected young people and city administrators investigate the needs and opportunities for youth engagement.

They make recommendations for tangible solutions to create vibrant communities in their own cities.

WHAT WE WANT TO ACHIEVE

KNOWLEDGE

- Youth-led insights into the needs and opportunities for youth engagement in cities
- Ideas for vibrant communities that young people and city decision-makers share
- Feasible and actionable suggestions for future city-wide youth engagement

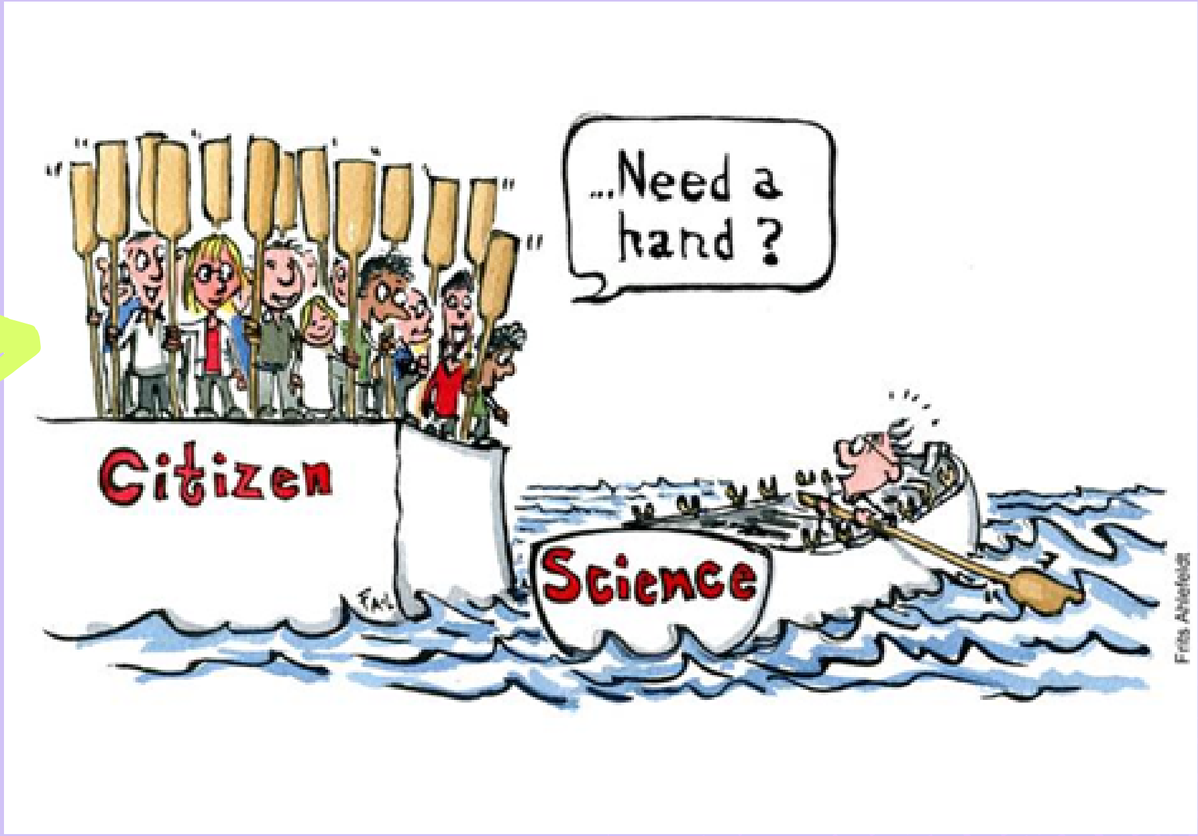
COMPETENCIES

- Scientific and democratic literacy
- Increased civic engagement and political efficacy
- Identity and belonging to their cities among participating young people and city administrators

SOLUTIONS

- City-specific and directly actionable proposals for solutions young people and city administrators would like to see
- Blueprint for a future youth engagement process in the city

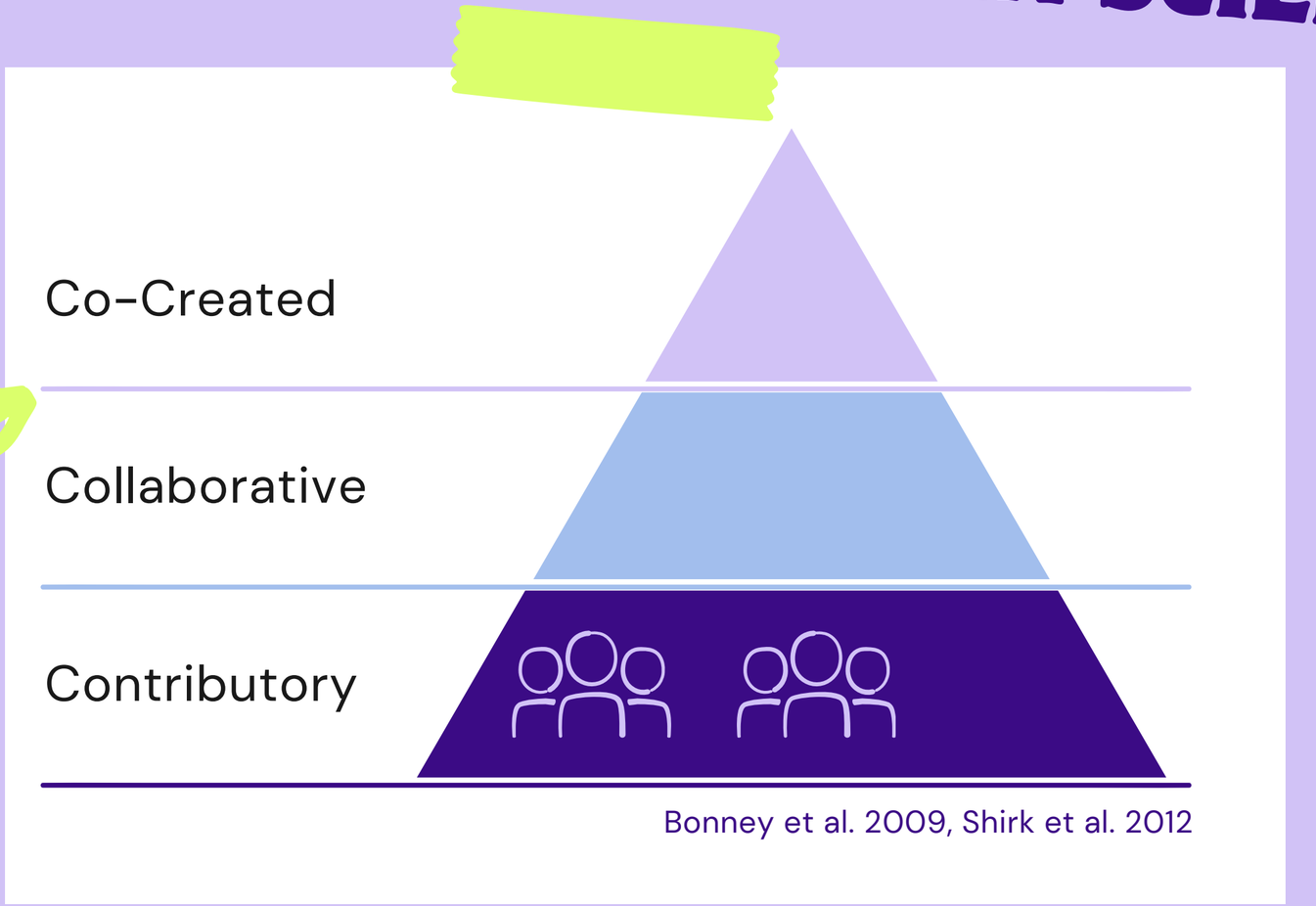
CITIZEN SCIENCE DESCRIBES THE PARTICIPATION OF PEOPLE WHO ARE NOT PROFESSIONAL RESEARCHERS IN SCIENTIFIC RESEARCH.



CLASSIFICATION OF PARTICIPATION IN CITIZEN SCIENCE

Co-Creating Our City

The citizen scientists formulate research questions, report observations, carry out research and data collection, analyze data, and/or write publications.



Bonney et al. 2009, Shirk et al. 2012

“CITIZEN SCIENCE AS A MEANS FOR DEMOCRATIZATION OF SCIENCE, PUBLIC ENGAGEMENT, EQUITY, AND JUSTICE.” IRWIN 1995

A key condition of citizen science is compliance with standards of rigorous research. This enables innovative research and new findings, and facilitates a dialogue between researchers and society that is very difficult to achieve otherwise.

Science as co-creation

THE SOCIAL SCIENTIFIC RESEARCH PROCESS

1. Articulating and specifying the research problem
2. Planning and preparing the research
3. Data collection
4. Data analysis
5. Reporting findings

1. Formulating Our Research Question

Collect ideas for the research topic

Literature review

Identification of research gaps

Articulation of research objectives and assumptions

Phase I

2. Planning and Preparing the Research

Choose research methods

Design research instruments (e.g. questionnaires, interview guides)

Determine who to ask (sampling)

Pretest or pilots of research methods

Phase II

3. Data Collection

Review data that may be already be available, e.g. policies, texts, secondary data

Conducting interviews, surveys, observations, etc.

Phase III

4. Data Evaluation

Process data to make it ready to be analyzed

Examine the evidence to understand meaning

Analyze data [or formal data analysis]

Phase IV

5. Reporting Findings

Compile topline findings

Publication

Presentation of results

Phase V

Closing Event

SOURCES ON CITIZEN SCIENCE

https://education.nationalgeographic.org/resource/citizen-science-article/

https://www.citizenscience.gov/#

RESEARCH QUESTION

CO-CREATING OUR CITY

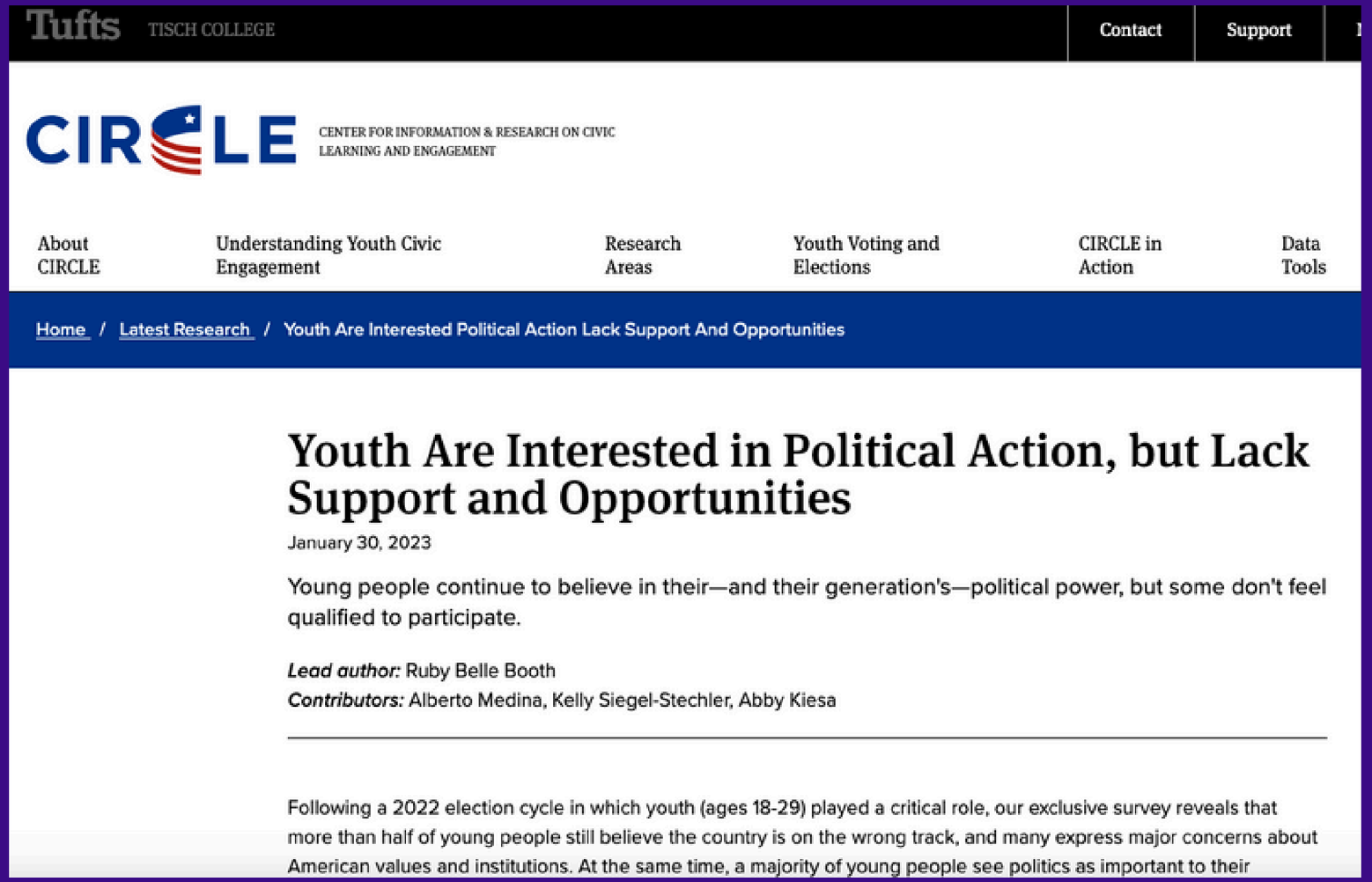
The following slides provide ideas for how to develop a research question.

Examples shown are taken from the pilot projects in Charlotte, NC and Düsseldorf, Germany. They illustrate how you could move from collecting ideas to a research question.

To adapt these to your own Co-Creating Our City project, replace the examples from our pilot cities with the work in your own project.

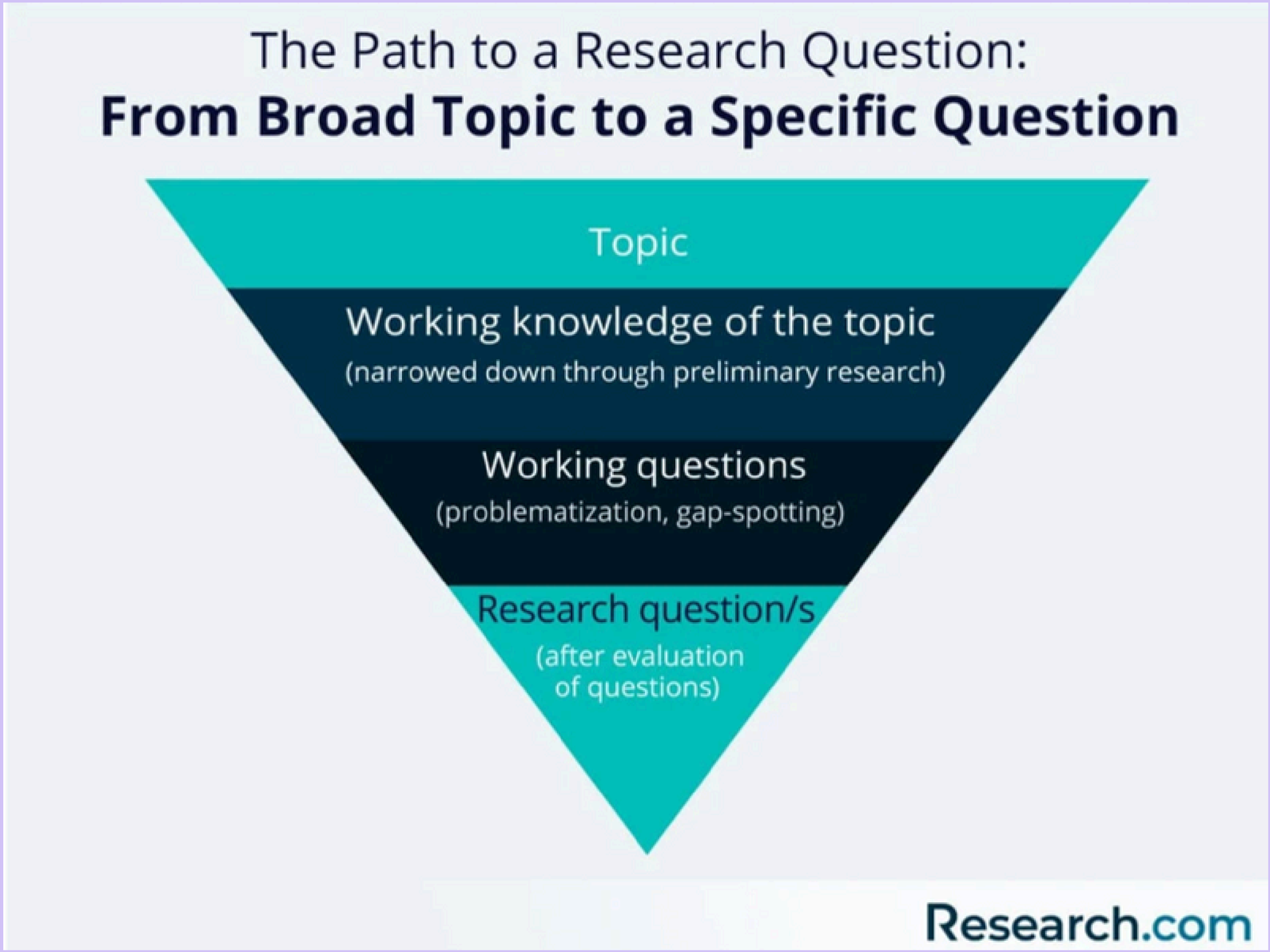
TUFTS UNIVERSITY YOUTH ENGAGEMENT DATA

Present findings that are relevant for your own Co-Creating Our City project and provide an overview of the existing research. In Charlotte, NC, we looked at Tufts University Youth Engagement data.



https://circle.tufts.edu/latest-research/youth-are-interested-political-action-lack-support-and-opportunities

WRITING A RESEARCH QUESTION



RESEARCH QUESTION

*Note that you are not arguing anything yet with the research question. It is just a format to make the topic more specific and easier for you to research.

Example of an unclear research question: How does the environment affect people?

Example of a clear research question: How does prolonged exposure to air pollution in urban areas impact the respiratory health of adults aged 50 and above over a five-year period?

https://www.sjsu.edu/writingcenter/docs/handouts/Research%20Questions.pdf

RESEARCH QUESTION CONTINUED

https://www.sjsu.edu/writingcenter/docs/handouts/Research%20Questions.pdf

01

Example Non-Open-Ended Research Question: Is Khan Academy beneficial in improving student test scores in mathematics?

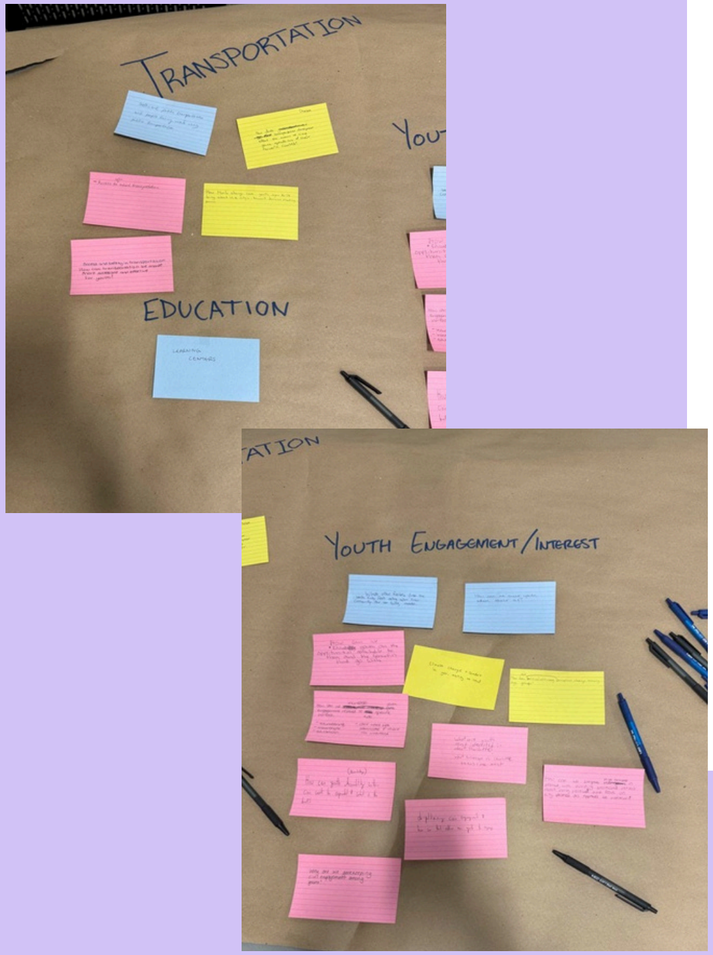
02

Example Open-Ended Research Question: How does student use of Khan Academy in mathematics improve students' understanding of mathematical concepts over time?

Example

RESEARCH QUESTION

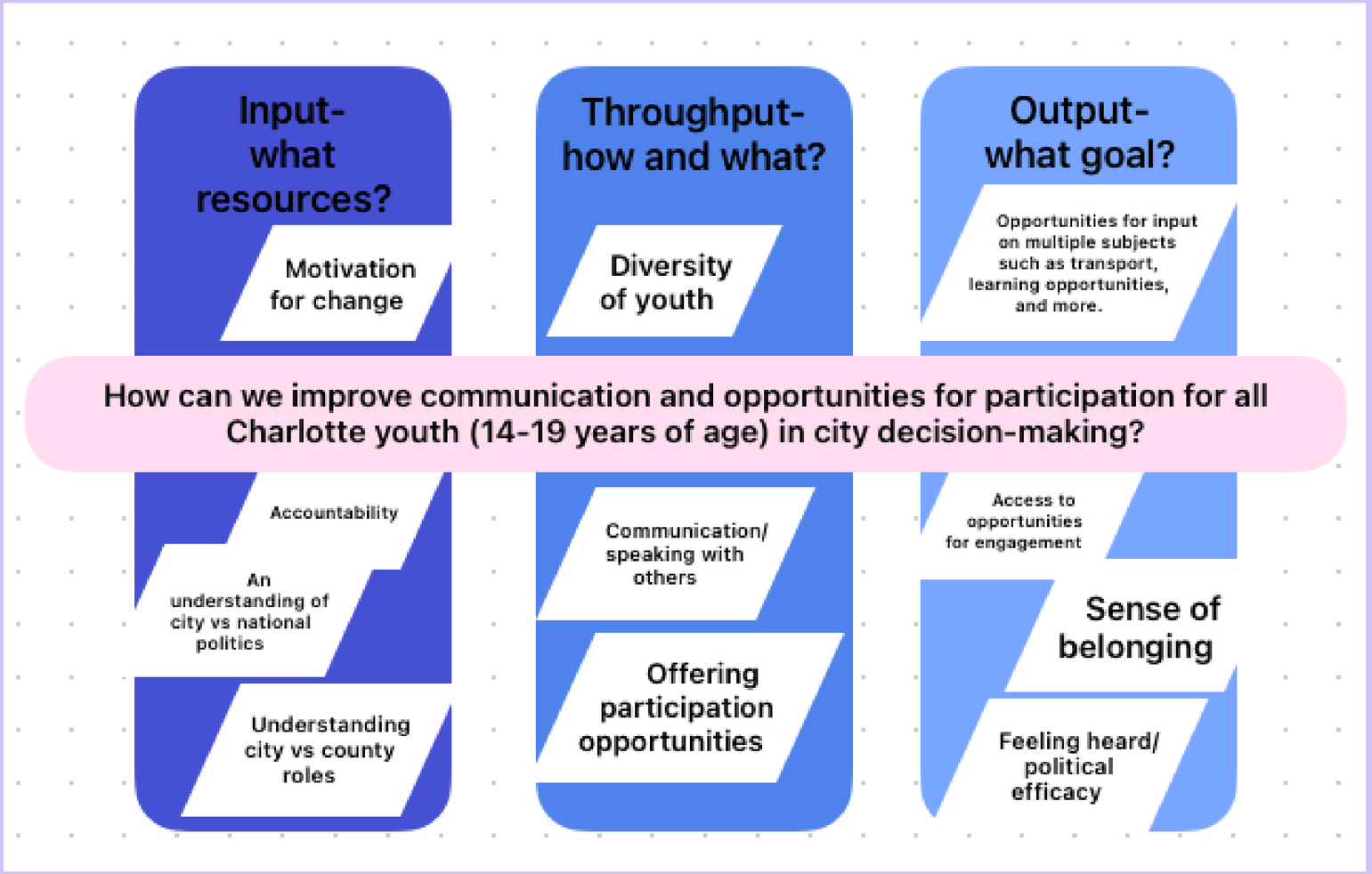
Present the interim results of the group work from the workshop and, possibly, the online collaboration in between.
This summary will be the starting point for the specific formulation of the research question.



Knowledge building	Transport	Motive for Engagement
What is the role of the city versus the county in youth programming?	How much change can youth (16-29) bring to the city's transit decision-making process?	How can engagement lead to community connections and a sense of belonging?
How can youth voices be amplified in policy-making beyond just surveys?	How can we increase access to safe, accessible transportation for youth?	How does youth perception of political efficacy impact engagement?
How can youth accountability be expanded in civic work?		What factors push youth away from being engaged in the community?

Example

RESEARCH QUESTION



PLANNING AND PREPARATION OF THE RESEARCH

CO-CREATING OUR CITY

The following slides provide ideas for how to design and select the research methods best suited to answering your project's research question.

Examples shown are taken from the pilot project in Charlotte, NC. They illustrate how you could make decisions on your research methods.

To adapt these to your own Co-Creating Our City project, replace the examples from our pilot city with what suits your project.

QUANTITATIVE VS. QUALITATIVE RESEARCH

Quantitative

- **Focus on collecting and analyzing numerical data to find patterns and test hypotheses.**
- Goal: explain, quantify, measure relationships
- Question: how many?
- Hypotheses are tested
- Sample size >100
- Sampling by system
- Statistical methods for evaluating the data
- Results can be generalized and representative

Qualitative

- **Explore subjective experiences and meanings through non-numerical data exploration**
- Goal: understanding, exploring, deeper insight
- Questions: why? how?
- Hypotheses are generated
- Sample size: <100, often 5-20 or a single case
- Sampling based on characteristics
- Various methods of evaluation possible
- Used to explore and understand complex concepts

METHODS

Quantitative

- **Text analysis methods:** Frequencies or correlations
- **Observation:** measurement of the frequency of customer contact
- **Eye-tracking:** gaze behavior
- **Survey research:** quantification through closed questions
- **Experiments:** behavioral correlation
- **Interviews:** closed questions
- **Data analysis:** descriptive or inductive statistics

Qualitative

- **Text analysis methods:** Interpretation of text content
- **Ethnography/field research:** observation protocols
- **Image analysis:** interpretation of image content
- **Interviews:** open, narrative, guideline-based
- **Data analysis:** interpretive (including qualitative content analysis)

HYPOTHESES

WHAT IS A HYPOTHESIS?

A hypothesis is an idea that is proposed as an argument to be tested to see if it might be true.

Hypotheses are statements about relationships between characteristics

Hypotheses form a coherent argument

Hypotheses must be testable and falsifiable

HYPOTHESES

EXAMPLES FOR HYPOTHESES

If students eat breakfast, they will perform better on exams than students who do not.

If social media usage among teenagers increases, then their face-to-face social interaction may decrease.

If flexible working hours are offered to employees, then their reported job satisfaction will increase.

HYPOTHESES

DEVELOPING HYPOTHESES

Hypotheses are tested against reality

Hypotheses are formulated based on what is known and assumed connections

Sources: Scientific literature & everyday observations

SPLIT INTO GROUPS TO DISCUSS

A: Which **qualitative methods** could we choose to answer our research question?

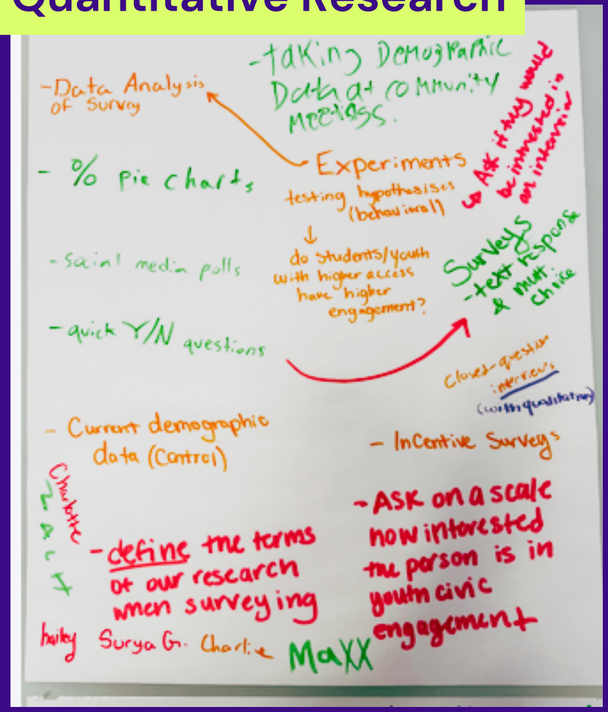
B: Which **quantitative methods** could we choose to answer our research question?

Example

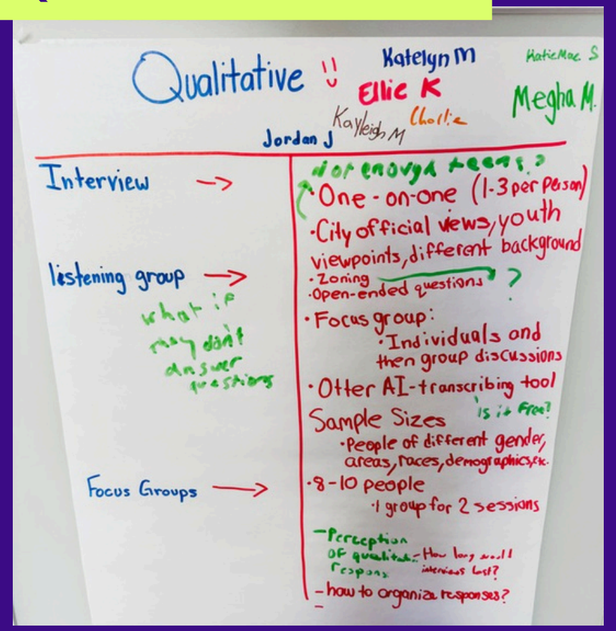
Planning and Preparation of the Research

Compile the ideas on research methods. As a group, decide on the methods for your own Co-Creating Our City project. It is also important to consider the feasibility of these methods within your resources.

Ideas for Quantitative Research



Ideas for Qualitative Research



METHODS PROS AND CONS

Present different methods that are suitable for your Co-Creating Our City project and from which the co-researchers can choose. These are examples from the Charlotte pilot project.

One-on-One Interview

+
- Few cases are necessary
- Opportunity for in-depth analysis.
- Opportunity to make connections.

-
- Time consuming
- Social desirability
- Generalizability of the results
- Follow-up is complex

Observation

+
- Captures natural behavior in real-world settings.
- Outside perspectives bring new insights.

-
- A combination of methods will be necessary
- Selective perception
- Confirmation bias
- Logistics

Survey

+
- Wide-ranging
- Generalizable results
- Anonymity
- Less risk of social desirability

-
- Lack of depth
- Lack of follow up
- Higher number of cases required

METHODS PROS AND CONS

Social Media Polling

+
- Potential for a high engagement
- Real time/quick feedback about an issue

-
- Run the risk that sample is mostly friends/acquaintances
- Lack of control of who participates
- Challenges with social media platform distribution

Behavioral experiments

+
- High control of outside factors.
- Allows for standardized procedures, observation of impacts of certain variables.

-
- Time requires to gain International Research Board approvals is limiting.
- Potential for artificial results

Listening session/Focus Group

+
- Uncovering insights related to group dynamics.
- Time for follow up questions and clarification.
- Observation of nonverbal cues.

-
- Need a plan for how to conduct the session, including dealing with difficult circumstances.
- Potential group dynamic bias/social desirability
- Time consuming data analysis

MIXED-METHOD DESIGN

Select methods for your own Co-Creating Our City project and then communicate how they will be applied. The following slides provide examples from the pilot project in Charlotte, NC.

In which areas do Charlotte youth want to contribute to city government and how can we increase access and engagement for youth (ages 14-24)?

Online Survey

1-1 Interviews

Focus Groups

DATA COLLECTION

CO-CREATING OUR CITY

To prepare them for data collection, the co-researchers need to be trained in the research methods selected for your project.

The following slides show examples of how the methods used in the pilot project could be introduced. They also provide guidance on how to plan data collection with the group.

To adapt these to your own Co-Creating Our City project, use and add to slides on methods you are using and replace others with information on methods chosen in your own project.

INTERVIEW

What is an interview?

Group and individual interviews

Sampling - selection process

Pilot testing

WHAT IS AN INTERVIEW?

A form of asymmetrical communication

A data collection method

Reactive research method -- the interacting individuals react to each other

Interviews are data gathered in a standardized way

Considered the “silver bullet” of qualitative research and frequently used

INTERVIEW METHODS

NARRATIVE INTERVIEW (NOT STRUCTURED)

SEMI STRUCTURED INTERVIEW

STRUCTURED INTERVIEW

EXPERT INTERVIEW

FOCUS GROUP

LISTENING SESSION

SEMI STRUCTURED INTERVIEWS

- The semi structured interview is based on guidelines that are used with some flexibility
- Order of questions can be variable
- Respondents can set priorities
- The interviewer can follow up on what has been said to understand better
- In analysis, guided interviews allow space for new discovery and theory building

SEMI STRUCTURED INTERVIEWS

- Setting is important
- Questions and question order are important
- Create a pleasant atmosphere for conversation
- Explain how the interview will be conducted
- Focus on the respondent(s) and take a back seat
- Be curious but not knowledgeable
- Ask questions, be ready to explain things
- No ambiguous or misleading questions
- Do not ask alternative questions or multiple questions
- Simple choice of words
- Set up and double check (and triple check) the recording device in advance
- Take notes during the interview

LISTENING SESSIONS

A moderator of a listening session must be prepared to intervene in a number of cases:

Someone is dominating the conversation

People are not responding or responding inappropriately

The conversation strays far off topic

The conversation remains superficial

Some group members do not speak

FIELD TESTING/ PRETESTING

Goals

- Train interviewers
- Review and improve the interview guide
- Is the guide easy to use?
- Is everything recorded?
- Do we have catagories, that represent our interests and the research question?
- Were important aspects overlooked?

Do a test run before the actual interview

OBSERVATION

Observation strategies

Challenges

Positives and negatives

Protocols

Pretesting

OBSERVATION

- Observations are based on guidelines developed by researchers
- Researchers directly observe and record behavior and environment
- Observation is non-interventional
- It is possible to gain qualitative and quantitative information through observation
- Structured observation includes a predetermined checklist and questionnaire for the researcher

CHALLENGES IN OBSERVATIONS

Going Native

Selective perception

The researcher unknowingly influences what is happening

Social desirability

OBSERVATION

POSITIVES

Can get information about what is already occurring

May discover some unknown information

NEGATIVES

Selective perception
- Confirmation bias
- Self-fulfilling prophecy

Not a representative sample

Observation logs help with negatives

OBSERVATION PROTOCOL

Starting Point

- Because no researcher is an objective observer -- it helps clarify what is being observed

What is an observation protocol?

- Dense description
- No interpretation
- Depict sequences of actions
- Problem: Writing down non-verbal communication

Function

- Structures the observation
- Reduces selective perception
- Generates standardized data
- Reduces risk of distortion due to memory errors

WHAT SHOULD BE INCLUDED IN A PROTOCOL?

1. Description of the field of investigation
2. Description of the physical space of the field of investigation
3. Description of interactions within the field
4. Description of one's participation in interactions in the field
5. Reflection on the research process
6. Self reflection

PRETEST/FIELD TEST

Goal

- Train observers
- Review and improve observation protocol
  - Is the protocol sheet easy to use?
  - Is everything recorded?
  - Are the categories clear?
  - Were important aspects overlooked?

Do a test run before the observation

SURVEY, QUESTIONNAIRE OR SOCIAL MEDIA POLLING

Question design

Questionnaire development

Tips for creating a questionnaire

Selection of interviewees

Pretest

QUESTIONNAIRE STRUCTURE

Salutation text

- Who are we?
- What do we want?
- Guarantee anonymity and informed consent
- Scientific purposes and rigour
- Process and assistance in completing the survey

- Simple introductory question introducing the topic
- Middle:
  - Develop a narrative (central questions in the second quarter; common thread; sort question blocks thematically)
  - Varied question types (multiple and single answers; open and closed; individual answers and scales)
- Sociodemographic data at the end (age, gender).
- Conclusion: Thank you for participation

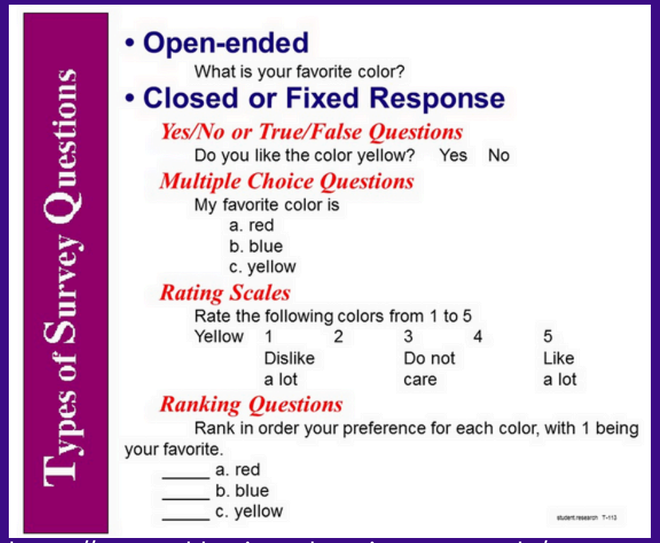
SURVEY CREATION TIPS

Questionnaire design

- Must hold your interest
- Be subject-related
- Topics must be of personal concern
- Be technically simple to complete
- Ask as many as necessary

Question formulation

- Formulate simply, not ambiguously
- Neither long nor complex
- Choose questions with a clear time reference
- Answering options must be unique and mutually exclusive
- Avoid jargon or define unclear terms



https://researchbasics.education.uconn.edu/types-of-survey-questions/

PRETEST/FIELD TEST

Goal

- Test the questionnaire before it is used:
  - Is the questionnaire easy to answer?
  - Is everything recorded?
  - Are the questions understandable?
  - Were important aspects overlooked?

Do a test run before the actual survey

GROUP WORK - BRAINSTROMING

1. Gather themes

What topics do you want to conduct the survey on?
What are you interested in?

2. Objects of investigation

Who do you want to study/ask questions?
What do you want to observe?

3. Building a survey instrument

A. Collect questions for the interviews.
B. Collect goals for observation.
C. Collect questions for the questionnaire.

4. Going into the field

How do you find/contact the people to be studied?
How do you come up with the participation formats?
Where can you have the questionnaire filled out?

5. Presentation of ideas

All groups present.

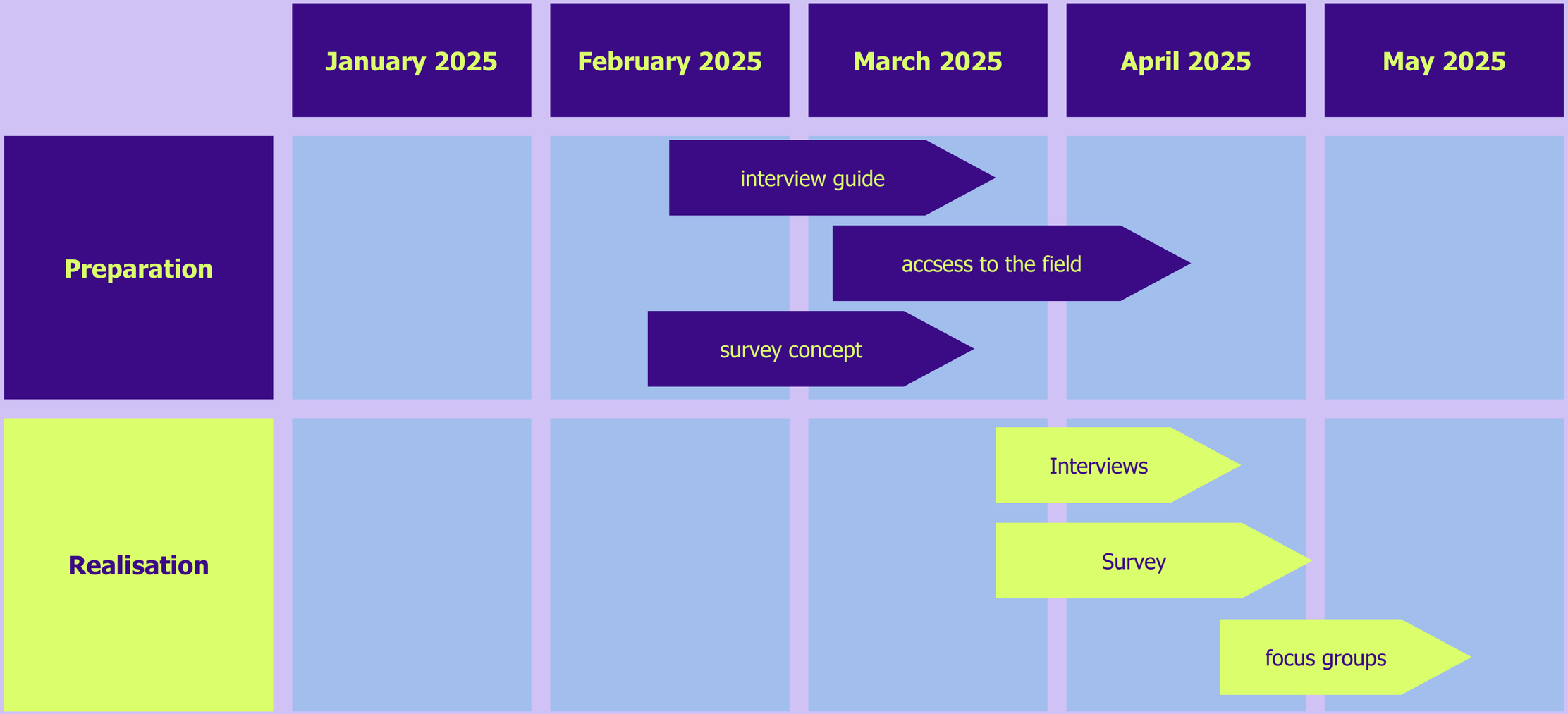
PLANNING DATA COLLECTION

1. Which work steps are involved?
2. What information do we need for this?
3. What preparations do we need to make?
4. Which people need to be involved?
5. How long do we need for the individual work steps?

These questions provide the basis for defining individual work steps and responsibilities within the group, as well as creating a schedule for data collection.

Example

RESEARCH TIMETABLE



DATA EVALUATION

CO-CREATING OUR CITY

The following slides provide ideas for how you could work through the data analysis with your co-researchers.

Examples show the analysis of semi-structured guided interviews and are taken from the pilot project in Düsseldorf, Germany. They illustrate how you could work together to analyse your data.

To adapt these to your own Co-Creating Our City project, consider giving a general introduction to data analysis and replace examples from our pilot city with material from your own Co-Creating Our City project.

DATA ANALYSIS

Method	Type	Purpose	Typical Use Case
Descriptive Statistics	Quantitative	Summarize and describe features of a dataset	Reporting demographics, summarizing survey responses
Inferential Statistics	Quantitative	Generalize findings, test hypotheses	Comparing group outcomes, assessing intervention impacts
Content Analysis	Qualitative	Categorize and interpret textual or visual data	Analyzing interview transcripts or open-ended survey responses
Grounded Theory	Qualitative	Inductively develop theory from data	Developing new theoretical frameworks from fieldwork
Case Study	Qualitative	In-depth analysis of a single unit (person, group, event)	Understanding specific organizations, phenomena, or communities
Ethnography	Qualitative	Study cultures/communities in their natural context	Observing daily practices in a community
Mixed-Methods	Mixed	Combine qualitative and quantitative for comprehensive view	Integrating surveys with interviews/focus groups

ANALYSIS PROCESS: QUALITATIVE CONTENT ANALYSIS

- Transcribe
- Read and discover
- Build categories and code
- Summarize and analyze
- Interpret and reflect

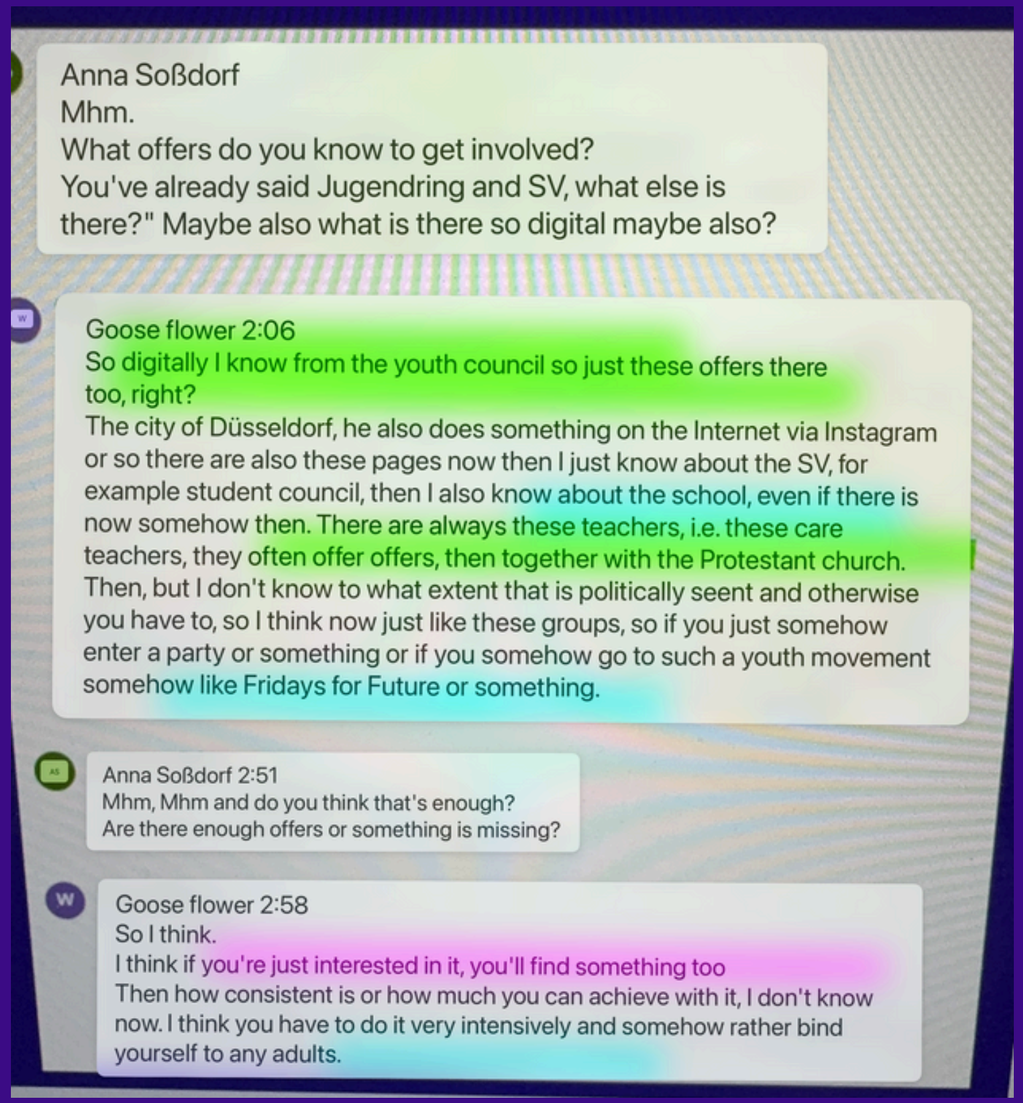
Example

READ AND DISCOVER

Engagement offers

Motivation/ Obstacles

Opportunity/ Network



BUILDING CATEGORIES AND CODING THEM

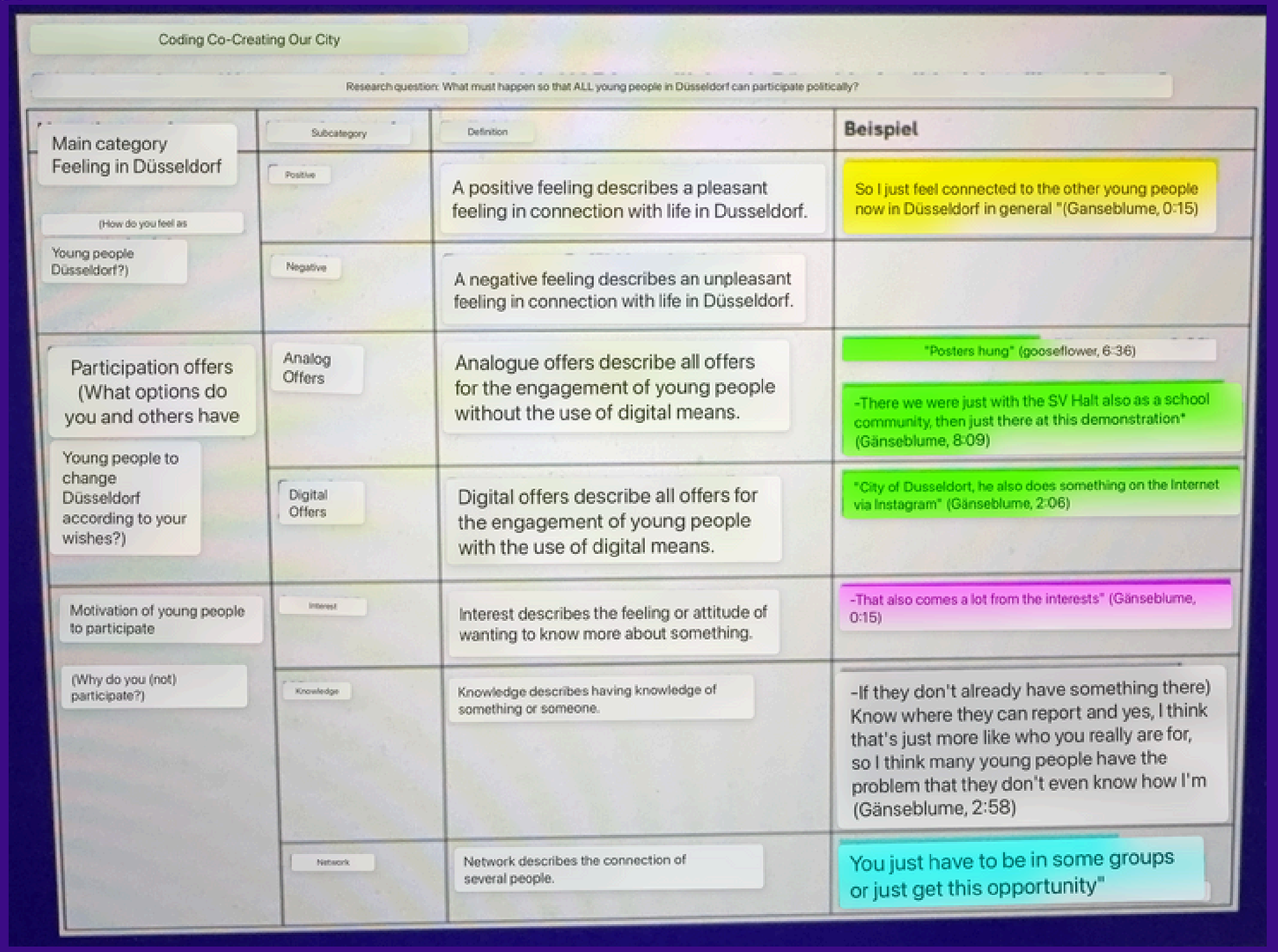
Feeling in Düsseldorf

Engagement-offers

Motivation/ Barriers

Knowledge

Opportunity/ Network



Coding Co-Creating Our City

Research question: What must happen so that ALL young people in Düsseldorf can participate politically?

Main category	Subcategory	Definition	Beispiel
Feeling in Düsseldorf (How do you feel as Young people Düsseldorf?)	Positive	A positive feeling describes a pleasant feeling in connection with life in Dusseldorf.	So I just feel connected to the other young people now in Düsseldorf in general "(Ganseblume, 0:15)
	Negative	A negative feeling describes an unpleasant feeling in connection with life in Düsseldorf.	
Participation offers (What options do you and others have Young people to change Düsseldorf according to your wishes?)	Analog Offers	Analogue offers describe all offers for the engagement of young people without the use of digital means.	"Posters hung" (gooseflower, 6:36) -There we were just with the SV Halt also as a school community, then just there at this demonstration" (Gänseblume, 8:09)
	Digital Offers	Digital offers describe all offers for the engagement of young people with the use of digital means.	"City of Dusseldort, he also does something on the Internet via Instagram" (Gänseblume, 2:06)
Motivation of young people to participate (Why do you (not) participate?)	Interest	Interest describes the feeling or attitude of wanting to know more about something.	-That also comes a lot from the interests" (Gänseblume, 0:15)
	Knowledge	Knowledge describes having knowledge of something or someone.	-If they don't already have something there) Know where they can report and yes, I think that's just more like who you really are for, so I think many young people have the problem that they don't even know how I'm (Gänseblume, 2:58)
	Network	Network describes the connection of several people.	You just have to be in some groups or just get this opportunity"

DISSEMINATION

CO-CREATING OUR CITY

The following slides provide an introduction to useful approaches from science communication to communicate your project's findings.

To adapt these to your own Co-Creating Our City project, consider adding examples that are relevant to your co-researchers and that can serve as inspiration for communicating your own Co-Creating Our City project.

WHAT IS SCIENCE COMMUNICATION?

To inform and inspire the public about scientific research

External science communication: researchers and the public enter into dialogue

- Communication departments of research institutions (e.g. university press offices)
- Researchers via the media (e.g. newspaper, TV or radio interviews)
- Events (open days, science nights, interactive exhibits)
- Directly via social media and blogs

Internal science communication: within scientific field(s)

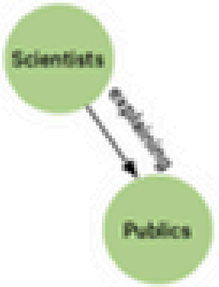
- Researchers exchange ideas with each other
- Focus: conferences and academic publications

DEVELOPMENT OF SCIENCE COMMUNICATION

Science communication

Models and phases over time*

*timescale does not mean no scicomm took place before 1980! This is a very Eurocentric view of the scicomm landscape

PREVAILING MODEL	**Deficit model** 'downstream engagement'; 'top-down'; 'disseminating'; 'entertaining'; 'one way'	**Dialogue model** 'two way'; 'consulting'; 'knowledge sharing'; 'deliberation';	**Participation model** 'upstream'; 'coproduction/cocreation'; 'negotiation'; 'knowledge building'
TERMS USED			
Trench 2008	Deficit	Dialogue	Participation
Stocklmayer 2013	Knowledge transfer	Knowledge sharing	Knowledge building
Horst 2008	Diffusion	Deliberation	Negotiation
Irwin 2014	First order	Second order	Third order
Palmer & Schibeci 2014	Type 2	Type 3	Type 4
Blue 2019	Linear, ahistorical approaches	Dialogic approaches	Cultural approaches
PHASE	**'Scientific Literacy'**	**PUS: Public Understanding of Science**	**PEST: Public Engagement with Science and Technology**
	One way dialogue from expert scientists to the public (who are ignorant and need to be given facts by scientists to fill the 'knowledge deficit'). A general sense that people should understand science and this knowledge could be tested like you test literacy or numeracy.		Concern about attitudes towards science led to the idea that science should interpret advances, and make them accessible to non-scientists. The theory was that this would improve public decision making and people would appreciate science more. Scicomm becomes more mainstream during this period.		A focus on dialogue and two way engagement between scientists and the public; more equal and active. The theory is, scientists listen, coverse and record the public opinion. Includes activities like 'Cafe Scientifique' and citizen juries. In practice though, do the public set the research agenda?		An increase in activities with a 'citizen science' component where public(s) engage in science with scientists and 'open science' where data, protocols etc are made available for public scrutiny, and coproduction, where researchers, practitioners and the public share power and responsibility for the work	

https://makinggood.design/thoughts/phd-part-08-what-is-science-communication/

WHAT IS THE PURPOSE OF EXTERNAL SCIENCE COMMUNICATION?

- Central element of a democratic society
- Can enable citizens to reflect on scientific facts and make informed decisions
- Enables participation in the knowledge of society
- Important to counter for dis- and misinformation

Arguments

WHY EXTERNAL SCIENCE COMMUNICATION?

The public gets an insight into

- topics of scientific research
- current and relevant debates in research
- the use of methods
- results and findings

Not a one-way street

- Not just providing information
- Dialogue with the public

Requirement or justification

- Much research is funded by the public / tax
- Researchers must be accountable to the public for their research

Arguments

WHY EXTERNAL SCIENCE COMMUNICATION?

Finding the next generation of researchers

- Stimulates enthusiasm for research
- Can motivates people to pursue research careers

Citizen science: Citizens as a way to enrich insights from research

- Citizens think outside of disciplinary standards
- Their perspectives can inspire researchers to think and research ‘outside the box’

CONDITIONS FOR SUCCESSFUL EXTERNAL SCIENCE COMMUNICATION

Know the target group

- Who do I address and how?
- Which medium do I choose for my target group? (e.g. social media, podcast, blog ...)

Balance between complexity reduction and simplification

- Content must be understandable for non-experts
- Reduction of complexity not at the expense of correctness of content

Create enthusiasm and spread passion

- If you are passionate about a topic, you can inspire others!
- Why is the topic important?
- What is exciting about it for the target group?

EXAMPLES OF SCIENCE COMMUNICATION