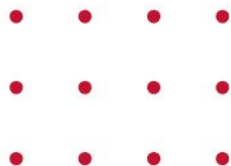


Empowering Stakeholders with Gen-AI: Delivering Dynamic and Accessible Data



Kirby Livingston

Data Strategy and
Institutional
Research Manager

Madison Speck

Institutional Research
and Student Affairs
Assessment Specialist

Shannon Foster

Associate Director for
Institutional Research
and Assessment

Carnegie Mellon University

Agenda

1. Introduction
2. Development of the Workflow
3. Implementation at Carnegie Mellon University
4. Challenges, Reflections, and Next Steps
5. Audience Q&A



Which of the following best describes your current level of engagement with NotebookLM?



"My Heart is in the Work."

Andrew Carnegie, Founder
November 15, 1900

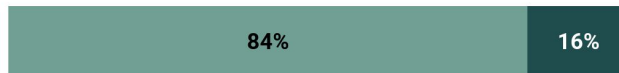
8,542
Grad Students



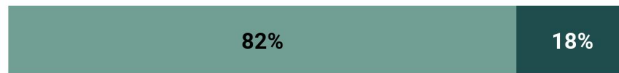
7,604
UGrad Students



1,615
Faculty



136,850
Active Alumni



■ US Citizen or Perm. Resident ■ International

Global Community

- Students representing **134** countries
- Faculty representing **55** countries
- Active alumni living in **153** countries



Duolingo, invented by professor Luis von Ahn (CS 2003, 2005), had 10 million downloads in 12 months and was named Apple's 2013 app of the year.



The **first smile in an email**, created in 1982 by professor Scott Fahlman



The first U.S. school to award a **degree in drama** in 1914



James Gosling (SCS 1983) invented the **Java computer programming language**.



Branch campuses: Qatar · Silicon Valley

Other locations include: Washington DC · New York · Los Angeles · Rwanda · Portugal · And More...

Carnegie Mellon University

What Notebook LM is and is NOT

It is...



- A **private environment** that answers questions using *only* the specific documents you provide, rather than the open internet.
- A **powerful engine** that identifies hidden patterns, themes, and connections across hundreds of pages of text.
- A **drafting partner** that converts raw data or sources into structured reports, presentation outlines, and visual concepts (such as mind maps).
- An **intuitive way to "chat" with your files** to find specific information without manual searching.

It is NOT...



- A **replacement**. It is an assistant that requires human oversight to validate accuracy and provide strategic direction.
- A **calculator**. It is a language model and does not perform the heavy-duty statistical modeling found in tools like SPSS or Tableau.
- A **"set-and-forget" solution**; the value of the output is directly tied to the quality of your uploaded sources and the precision of your prompts.

https://notebooklm.google.com/

The screenshot displays the NotebookLM web application. The top navigation bar includes a "Create notebook" button, "Analytics", "Share", "Settings", and a "PRO" label. The main interface is divided into three sections: "Sources", "Chat", and "Studio".

Sources: A sidebar on the left with a search bar and filters. It shows "Home | AIR" as the selected source.

Chat: The central area shows a chat history for "AIR 2026" (1 source · May 7, 2026). The chat content includes:

The **2026 AIR Forum** is an upcoming professional conference scheduled for late May in **Washington, D.C.**, hosted by the **Association for Institutional Research**. This annual event serves as a premier gathering for **higher education professionals** focused on data-driven decision-making, institutional effectiveness, and research. Attendees can participate in over **200 educational sessions** and pre-conference programs held at the **Marriott Marquis** and nearby Westin hotel. Testimonials from previous participants highlight the event's value in fostering **global networking** and exploring modern topics like **artificial intelligence**, data governance, and student success. Ultimately, the forum aims to empower "change agents" who use **analytical insights** to improve postsecondary institutions.

Below the text are interaction buttons: "Save to note", "Copy", "Like", and "Share".

Two chat prompts are visible:

- What are the key professional topics covered at AIR Forum?
- Tell me about the logistics and location for AIR 2026.

A text input field at the bottom says "Start typing..." with a "1 source" indicator and an arrow button.

Studio: A sidebar on the right with a "Customize" button. It contains a grid of tool cards: Audio Overview, Slide Deck, Video Overview, Mind Map, Reports, Flashcards, Quiz, Infographic, and Data Table. Below the grid, a message states: "Studio output will be saved here. After adding sources, click to add Audio Overview, Study Guide, Mind Map, and more!" with a blue arrow icon. An "Add note" button is at the bottom.

NotebookLM can be inaccurate; please double check its responses.

The screenshot shows a Google Home screen with a grid of app icons. At the top, there are links for "Gmail" and "Images", a grid icon, and a profile picture. A red arrow points from the grid icon to the NotebookLM icon in the app grid.

The app grid includes:

- Sites
- Groups
- YouTube
- Maps
- News
- Photos
- Translate
- Contacts
- Keep
- Cloud Se...
- Earth
- Saved
- Travel
- Password ...
- Notebook...** (circled in black)

NotebookLM Free Tier: Limits & Features (2026)

All the key specifications you need to know as a free user.

CORE LIMITS (DAILY & PER ACCOUNT)

	Total Notebooks	100	You can have up to 100 active notebooks in your account.
	Sources per Notebook	50	Each individual notebook is capped at 50 sources.
	Words per Source	500,000	Roughly equivalent to a 1,000-page book per source.
	File Size per Source (Local Uploads)	200MB	Hard file size limit for uploaded files.
	Daily Chat Queries	50	Resets every 24 hours.
	Daily Audio Generations	3	Includes Audio Overviews (podcasts). Resets every 24 hours.
	Daily Video Generations	3	Standard video overviews only. No Cinematic features.
	Sharing Options	Full Access	Share notebooks as Viewers or Editors.

NEW & ENHANCED IN 2026

	Media Diversity	Sources now include PDFs, Google Docs, YouTube URLs, Website URLs, and audio files (MP3 / M4A). Audio files are transcribed and analyzed.
	Deep Research	Limited Deep Research sessions for free users. ~10 sessions per month to browse the live web and find new sources for you.
	Enhanced Context (Memory)	Powered by Gemini 3 with up to 1 million tokens of context window—better memory across all your sources and chats.
	Faster & Smarter	Improved accuracy, reasoning, and ability to synthesize information across large documents and multiple sources.

QUICK REFERENCE (DAILY & MONTHLY LIMITS)


50

Chat Queries
per day


3

Audio Overviews
per day


3

Standard Videos
per day


~10

Deep Research
per month



GOOD TO KNOW:

Daily limits (Chat, Audio, Video) reset every 24 hours.
Deep Research limit resets every month.



YOUR PRIVACY MATTERS:

Your data is not used to train public AI models.
Your notebooks and sources remain private.



NotebookLM

Why NotebookLM?

The challenge isn't a lack of data, it's data synthesis.

NotebookLM can help you make sense of complex, document-heavy work **quickly** and **accurately**.

A few practical examples...

- Navigate complex policies or documents instantly
- Contextualize campus data with national research
- Turn feedback into insights, especially for unstructured data
- Centralize reports, budgets, and lessons learned
- Connect mission, outcomes, and data
- Identify gaps and trends across years

Grounding NotebookLM in Intentional Inquiry

Start with a clear purpose. Structure your notebook intentionally.
Get synthesis you can trust and act on.



Research Purpose

Define the questions or insights you're seeking and why they matter.



Notebook Guide

Your guide sets the framing, scope, and synthesis goals for the AI.



Curated Sources

Upload only the sources that are relevant and intentional.



Meaningful Synthesis

NotebookLM delivers insights, patterns, and connections that matter.



Prevents
“document dumping”



Improves
relevance and trust



Keeps humans
in control

“

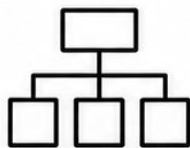
Your Notebook Guide is the recipe. Your research purpose is the dish you're trying to make.

Customizing NotebookLM with a Notebook Guide



Purpose & Audience

- Defines the notebook's project focus, goals, and intended users
- Ensures analysis is aligned with stakeholder decision-making needs



Sources & Data Hierarchy

- Identifies all relevant documents and data types
- Establishes a clear order of interpretive priority
- Uses mission/framework documents for alignment, not primary analysis



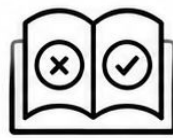
Interpretation & Formatting

- Provides explicit instructions for parsing qualitative and quantitative data
- Ensures consistent treatment of headings, responses, and metrics



Analytical Framework

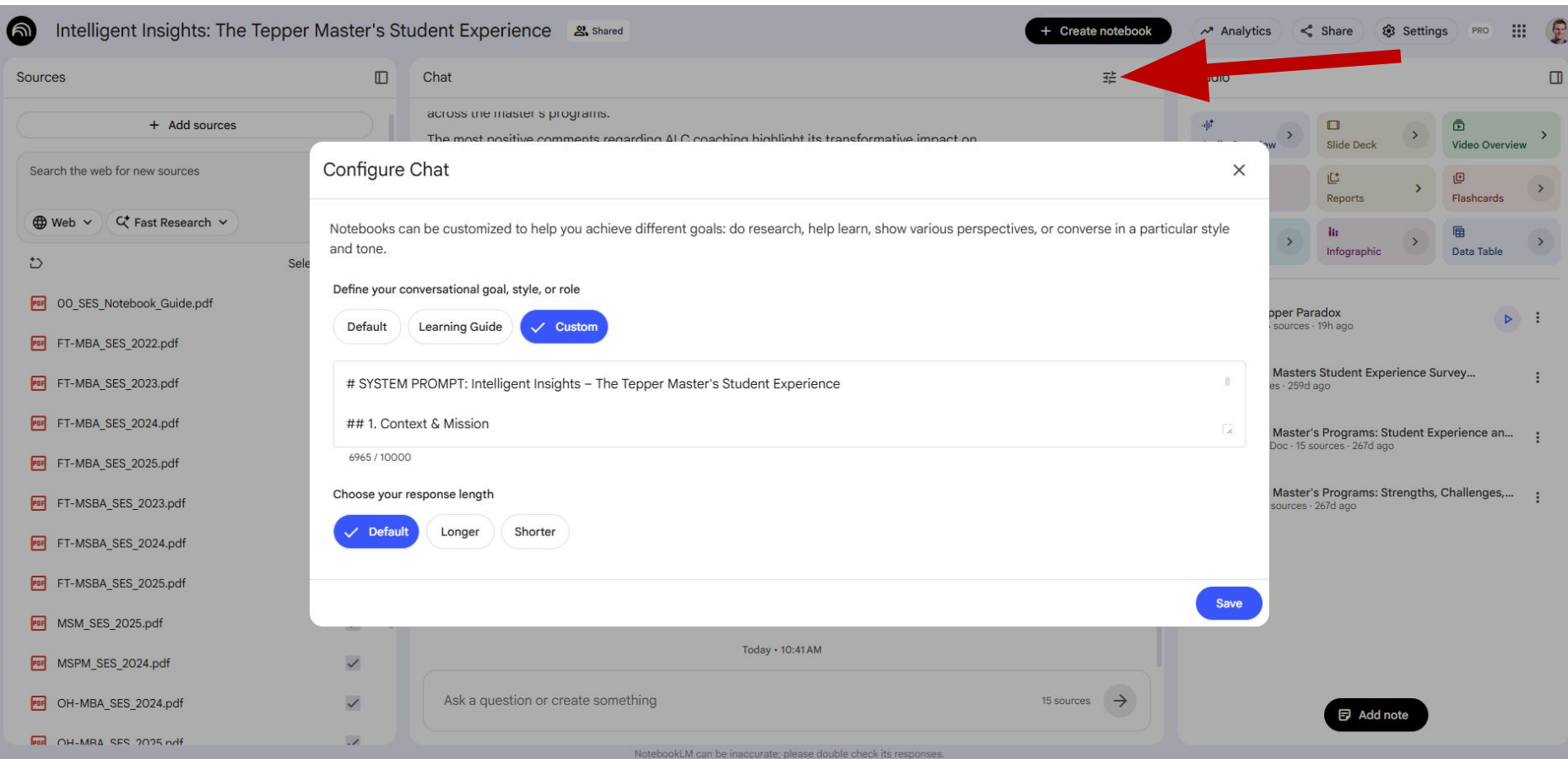
- Organizes findings around key thematic domains
- Integrates mixed-methods evidence (quantitative + qualitative)
- Anchors insights to stated outcomes and goals



Reminders & Guardrails

- Protects confidentiality through anonymization and aggregation
- Defines standards for high-quality, evidence-based analysis
- Produces clear, actionable, leadership-ready insights

Layered Prompting Strategy Part 2: Configure Chat



The screenshot shows the 'Intelligent Insights: The Tepper Master's Student Experience' interface. A red arrow points to the chat icon in the top navigation bar. The 'Configure Chat' modal is open, showing options to define conversational goals and response length.

Intelligent Insights: The Tepper Master's Student Experience

Shared

+ Create notebook

Analytics

Share

Settings

PRO

Sources

Chat

+ Add sources

Search the web for new sources

Web

Fast Research

OO_SES_Notebook_Guide.pdf

FT-MBA_SES_2022.pdf

FT-MBA_SES_2023.pdf

FT-MBA_SES_2024.pdf

FT-MBA_SES_2025.pdf

FT-MSBA_SES_2023.pdf

FT-MSBA_SES_2024.pdf

FT-MSBA_SES_2025.pdf

MSM_SES_2025.pdf

MSPM_SES_2024.pdf

OH-MBA_SES_2024.pdf

OH-MBA_SES_2025.pdf

Configure Chat

Notebooks can be customized to help you achieve different goals: do research, help learn, show various perspectives, or converse in a particular style and tone.

Define your conversational goal, style, or role

Default

Learning Guide

✓ Custom

SYSTEM PROMPT: Intelligent Insights – The Tepper Master's Student Experience

1. Context & Mission

6965 / 10000

Choose your response length

✓ Default

Longer

Shorter

Save

Today • 10:41 AM

Ask a question or create something

15 sources

Add note

NotebookLM can be inaccurate; please double check its responses.

How it Works: NotebookLM in Practice



Identify

Based on your research questions or areas of inquiry, choose the key source documents for your project.

Prepare

Clean and organize your data. Create an effective "Notebook Guide" to direct AI's focus and analysis. Ensure documents are clear and well-formatted.

Upload

Securely add your sources to a new notebook.

Prompt

Start by posing clear, relevant questions to the notebook – begin with broad, overarching prompts and gradually refine them into more specific, focused inquiries.

Validate

Critically review all outputs, checking them against your sources for accuracy.

All

My notebooks

Shared with me



Most recent ▾

+ Create new

Recent notebooks



Create new notebook

2025 Pittsburgh FTFY
Orientation

Oct 29, 2025 · 10 sources

Tepper Faculty
Research Insights (AI...

Aug 4, 2025 · 221 sources

CMU Spring Carnival
Social Media Sentime...

Oct 27, 2025 · 5 sources

Faculty
Accomplishment...

Mar 30, 2026 · 96 sources

Intelligent Insights: The
Tepper Master's...

Aug 18, 2025 · 15 sources

Exploring Assessment
Findings at CMU

Aug 26, 2025 · 8 sources

ALOA Business
Checking Statements

Nov 16, 2025 · 35 sources

Microeconomics 47800
AI Tutor

Aug 25, 2025 · 24 sources

Tepper First Gen Focus
Groups

Mar 17, 2025 · 6 sources

Tepper MBA Program:
Insights for...

Aug 13, 2025 · 2 sources

Tepper OH MBA
Student Experience...

May 14, 2025 · 2 sources

Using Chat Effectively: Investigative Prompting

Broad exploration → Meta-prompting → Targeted synthesis

- **Broad Exploration**
 - Start with open-ended questions
 - *Example: "What themes emerge in this dataset?"*
- **Meta-Prompting**
 - Ask AI what questions you should ask
 - *Example: "As a residential life coordinator, what strategic questions should I ask about this data?"*
- **Targeted Synthesis**
 - Focus on comparisons and specific insights
 - *Example: "Compare belonging metrics by gender"*

Move from curiosity → strategy → actionable insights

Tepper School of Business Use Case: Master's Student Experience Surveys

3 years of student experience survey data
with hundreds of open responses.

Analyst and stakeholder capacity
constraints → used Gemini and
NotebookLM to improve efficiency.

*For more on leveraging AI for qualitative
analysis, come to my speaker session:*

**Your AI Co-Analyst: A Practical
Blueprint for Qualitative Analysis**

Thursday, May 28, 2026

10:45 AM – 11:30 AM

Marquis Salon 1 Room (ML2)



Carnegie Mellon University

Tepper School of Business Use Case: Master's Student Experience Surveys



Q2.1 - Please rate the quality of your Tepper School MBA experience across the following areas:
235 Responses

Field	Poor	Fair	Good	Very good	Excellent
Academic experience	8%	29%	36%	23%	
Student life / Extracurricular experience	5%	9%	32%	35%	19%
Career preparation	6%	16%	40%	26%	12%
Leadership preparation	6%	13%	38%	27%	15%

NotebookLM is optimized for text and can not accurately interpret data visualizations.

After switching to standard data tables, accuracy improved significantly.

Tepper School of Business Use Case: Master's Student Experience Surveys

Tone inflation in outputs was a prominent issue initially.

The AI also struggled to delineate the start and end points of individual responses.

Q9.6 - *Optional* Please share up to three aspects of the [redacted] [redacted] program that you have found particularly positive or beneficial.

53 Responses

I really enjoyed taking classes outside of [redacted] - at [redacted], the ability to enroll in courses in other buildings was hugely beneficial and fun.

1

Although there a [redacted], many of the teachers here are truly world class. I enjoyed getting to know them both in the classroom and during office hours.

1. ALC
2. 1-1 Career Counsellors
3. [redacted]

2

The emphasis on data driven and quant has been very helpful.

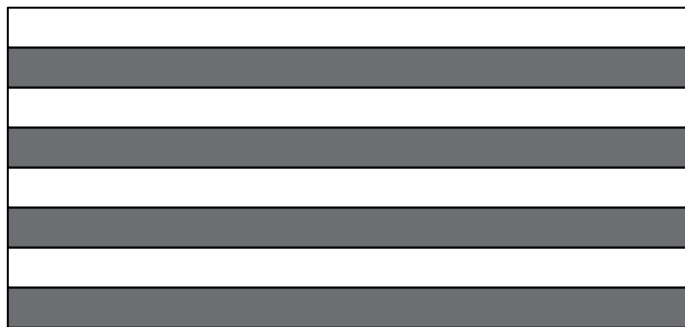
3

The faculty and administrative staff demonstrated genuine investment in student success — that care was consistently evident and represents a real institutional asset. The student body itself was a significant source of value; cohort-driven clubs and peer networks reflected a culture of mutual investment that the program did not create [redacted]. When coursework was anchored to specific applied problems, the teaching quality was high and the learning was tangible.

4

Tepper School of Business Use Case: Master's Student Experience Surveys

NotebookLM can't *intuitively* understand visual layout cues.



The Challenge



**Added to prompt:
Treat each alternating
background color shift
as a new respondent.**

The Solution

Note: In Late 2025, NotebookLM started accepting Google Sheets as sources, which is a more reliable solution to this problem.

Exploring Assessment Findings with NotebookLM:

Synthesizing Multiple Types of Student Experience Data

→ Qualitative student voices

- ◆ Focus group transcripts (cleaned)

→ Quantitative survey trends

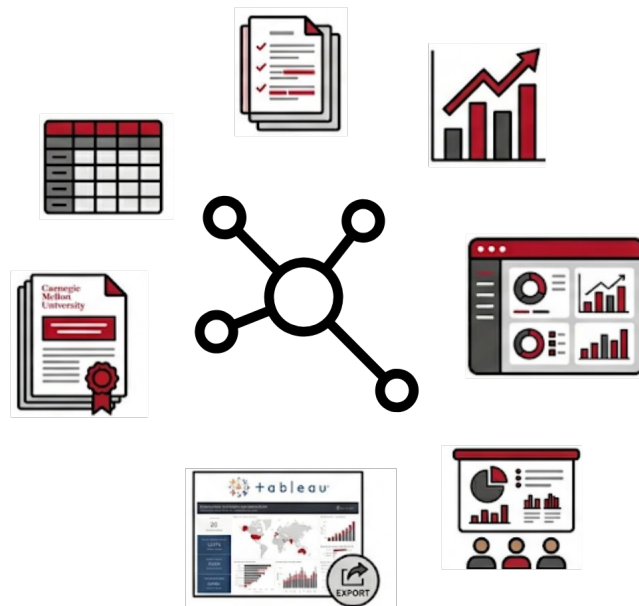
- ◆ Qualtrics reports
- ◆ Data tables

→ Executive summaries

- ◆ Leadership presentations
- ◆ Final reports

→ Dashboard data

- ◆ Tableau screenshots/exports



Implementation at Carnegie Mellon: *Exploring Assessment*

 Exploring Assessment Findings at CMU Shared

+ Create notebook

Analytics

Share

Settings

PRO



Sources

+ Add sources

Search the web for new sources

Web Fast Research

OO_Exploring Assessment Results_No...

01_S25 Exploring Assessment Finding...

2025 ESS - Senior & College Leaders...

ESS_GESS_ Executive Leadership Pre...

Focus Group Transcripts_Refined 25A...

HealthyU_ Executive Leadership Prese...

Tartan VOICES Final Report_21OCT24....

Tartan VOICES_Executive Leadership ...

Chat

Customize



Exploring Assessment Findings at CMU

8 sources · Aug 26, 2025

The provided documents establish a comprehensive framework for analyzing the **Carnegie Mellon University student experience** by combining statistical data with personal narratives. One source outlines a **structured methodology** for university leadership, positioning survey-based quantitative data as a secondary tool to validate primary qualitative findings. This quantitative component includes the **2025 Enrolled Student Survey**, which tracks institutional metrics such as academic satisfaction, wellness, and demographic diversity across the Pittsburgh campus. Complementing these figures, the focus group transcripts offer **intimate perspectives** from graduate students, athletes, and Tartan Scholars regarding campus culture. These conversations highlight specific **pressure points**, such as the challenges of balancing rigorous workloads with mental health and the importance of niche support networks. Collectively, the sources serve as a **decision-making guide** for executive leadership to address student needs through a blend of objective trends and lived experiences.

Save to note



How does student satisfaction with community compare to academic rigor?

What are the primary barriers preventing students from accessing wellbeing resources?

Ask a question or create something

8 sources →

Studio

Audio Overview

Video Overview

Reports

Quiz

Data Table

Slide Deck

Mind Map

Flashcards

Infographic

Reinforcing the Student Blueprint

Humanizing Academic Rigor

University Student Experience 2025...

Competency Friction: Stress, Literacy,...

Student Strategies for Stress...

Student Identity, Belonging, and...

NotebookLM can be inaccurate; please double check its responses.

Additional Use Case Examples

- Creating a **“Master” Data Notebook**
- **Synthesizing data** for report preparation
- Uploading surveys and creating an **item bank**
- Uploading a **handbook/policies** for campus community use
- **Accreditation** processes with hundreds of documents



Access & Notebook Sharing Considerations

The screenshot shows a Jupyter Notebook interface. At the top, the notebook title is "2025 Pittsburgh FTFY Orientation" with a "Shared" status icon. The top right contains buttons for "Create notebook", "Settings", "PRO", and a user profile icon. The main content area displays the notebook title and a "Chat" window. A sharing modal is open on the right, titled "Share '2025 Pittsburgh FTFY Orientation'", with a close button (X). It includes a search bar "Add people and groups *", a section "People with access" with a "Notify people" checkbox (checked), and a list of users: Nicole Perrotta (viewer) and Kirby Livingston (viewer). At the bottom of the modal, there are two buttons: "Copy link" and "Copy link to chat view". The "Copy link" button is circled in red. The "Copy link to chat view" button is also visible. The background shows a chat window with a "Customize" button and a text input field at the bottom.

2025 Pittsburgh FTFY Orientation

10 sources · Oct 29, 2025

Chat

Customize

Share "2025 Pittsburgh FTFY Orientation"

Add people and groups *

People with access

Notify people ☒

Nicole Perrotta
nperrott@andrew.cmu.... Viewer

Kirby Livingston
kirbyl@andrew.cmu.edu Viewer

Copy link

Copy link to chat view

Save

Ask a question or create something

Tip: Make sure only one "Editor" has the Notebook open while making changes to sharing settings.

Things to Keep in Mind When Using NotebookLM

- It only outputs information anchored to the sources you upload.
- It will provide you with citations, so use them for data quality checks.
- It makes data exploration easy – almost too easy! Make sure to differentiate between interesting and actionable.
- Keep your Notebook and queries grounded in the purpose outlined in your Notebook Guide.
- Iterate and contextualize your queries as you learn more from your data.



Challenges and Considerations

NotebookLM can accelerate synthesis, but studio outputs still need human review, refinement, and quality control before they are stakeholder-ready.

Reports & Data Quality

- Use citations to check for sources and accuracy.
- Draft reports may be repetitive or not yet stakeholder-ready.
- Watch for tone inflation and dramatization.

Representation & Evidence

- Outputs can overweight vivid or extreme responses.
- Extreme viewpoints may appear more typical than they are in the data.
- Human review is needed to rebalance.

Slides & Visual Iteration

- Slides are typically not exactly what you want on the first pass.
- Updating can require tools like Canva or Google Slides.
- More iterations can sometimes make visuals less polished.

Export, Portability & Limits

- No formal export for some summarized or mapped work.
- Sharing is mostly individualized, with limited group sharing.
- Free tier limits include daily chat and overview generation caps.

Practice implication

Treat NotebookLM as a drafting and synthesis environment not a final-production tool. Validate evidence, adjust tone, check representativeness, and finish materials for the audience.

Our Reflections on Leveraging NotebookLM

A practical framework for using NotebookLM with purpose, evidence, and human judgment.

Questions we asked

1 | What role should NotebookLM play?

2 | What types of sources are appropriate?

3 | How do we keep the tool aligned with the project's purpose?

4 | How do we know the output is trustworthy?

5 | What responsibilities stay with the researcher?

What we learned

Researcher-facing: Best for synthesis and drafting.
Stakeholder-facing: Innovative self-service tool.

Source selection needs to be purpose-driven. More documents do not automatically produce better results.

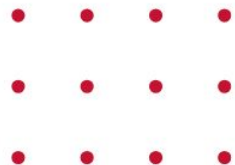
A Notebook Guide helps define scope, audience, tone, analytic expectations, and boundaries.

Outputs require source-checking, nuance-checking, and human revision before use.

Human judgment remains essential for interpretation, equity, transparency, and translation.



Audience Q & A



Interested in More from Carnegie Mellon University?

Empowering Stakeholders with Gen-AI: Delivering Dynamic and Accessible Data

Tuesday, May 26 – 3:00 - 4:30 pm
Catholic University/Univ. of DC Room

Shannon Foster,
Associate Director for Institutional Research and Assessment

Madison Speck,
Institutional Research and Student Affairs
Assessment Specialist

Kirby Livingston,
Data Strategy and Institutional Research Manager,
Tepper School of Business

Institutional Data Architecture: People, Structures, and Strategy

Wednesday, May 27 – 11:15 - 12:15 pm
Sebastian L1+2

Jason Wang, Georgia Institute of Technology

Ivana Fredotovich, Weber State University

Melissa Baker, Carnegie Mellon University

Paige Borden, University of Central Florida

The Ripple Effect: How Small Actions Foster Strong Leadership

Wednesday, May 27 – 11:15 - 12:15 pm
Marquis Salon 12/13 Room

Henry Zheng, Carnegie Mellon University

Yesenia Espinal, Howard University

Adrea Hernandez, University of Notre Dame

Hui Xiong, Wellesley College

Tableau vs. PowerBI: A Case Study in Transitioning Between BI Tools

Thursday, May 28 – 9:45 - 10:30 am
George Washington University Room

Matthew Hoolsema,
Director for Data Science and Advanced Analytics

Brandon Hutton,
Manager of HR Data and Analytics

Your AI Co-Analyst: A Practical Blueprint for Qualitative Analysis

Thursday, May 28 – 10:45 - 11:30 am
Marquis Salon 1 Room

Kirby Livingston,
Data Strategy and Institutional Research Manager,
Tepper School of Business

Leveraging LMS Data to Enhance Academic Advising and Early Alert Systems

Thursday, May 22 – 9:45-10:30 am
Catholic University/Univ. of DC Room

Diana Lomelin,
Data Scientist

Matthew Hoolsema,
Director for Data Science and Advanced Analytics

Decentralized Institutional Research Through the Lens of Branch Campuses

Friday, May 23 – 8:00-8:45 am
Dogwood Room

Malak Alseaf,
Lead of Information and Analytics
Carnegie Mellon University in Qatar

Trent Kennedy,
Senior Institutional Research Analyst
Georgetown University in Qatar





Sources

Select all ☒

- 00. FTFY 2025 Orientation Notebook LM System I... ☒
- 2025 CMU Orientation Survey - Results.pdf ☒
- FTFY Fall 2025 Pittsburgh Orientation Dashboard... ☒
- FYO 2025 Housing Community Mean Report ☒
- FYO 2025 Kick-Off Meeting (1).pdf ☒
- FYO 2025 Overall Mean Report ☒
- FYO Overview_Academic Advisors Meeting_SP26... ☒
- First-Year Orientation Mission, Outcomes & Fram... ☒
- Full open-ended analysis Pittsburgh ORI 2025.pdf ☒
- Orientation Pittsburgh 2025 Extended Responses ☒

Chat



2025 Pittsburgh FTFY Orientation

10 sources · Oct 29, 2025

These documents detail the **strategic planning and evaluation** of Carnegie Mellon University's 2025 First-Year Orientation. A comprehensive **assessment of the 2024 program** reveals that while a vast majority of students rated their experience as **positive**, many reported feeling **physically exhausted** due to a dense, repetitive schedule. Administrative slides outline a **refreshed framework** for the upcoming year, focusing on **community belonging**, academic transitions, and improved support for **neurodivergent and international populations**. Survey data highlights a strong desire for more **organic exploration of Pittsburgh** and fewer redundant information sessions. The materials also provide a **logistical timeline** for campus partners and student leaders to coordinate major events like **Convocation and Well-Being Day**. Ultimately, the sources illustrate a data-driven effort to balance **resource education** with the personal health and social needs of incoming students.



What are the most common student complaints about orientation?

How do student emotions change before and after ori...tion?

Ask a question or create something

10 sources



Studio



These studio outputs give an in-depth visual and audio overview of the notebook topic!

- Insights for Small Group Curriculum 28d ago
- Student Well-Being Strategy 10 sources · 28d ago
- Key insights for Well-Being Day 28d ago
- 2025 Sensory Inclusion Orientation Report 10 sources · 63d ago
- Neuroinclusive Orientation and Sensory Support... 69d ago
- 2026 Orientation Strategy 10 sources · 70d ago
- 2026 Orientation Strategy 10 sources · 71d ago
- First-Year Student Transition Data Report 10 sources · 71d ago
- Orientation 2025 Summary 8 sources · 99d ago
- Feelings Snapshot 8 sources · 140d ago
- ...