

# Exploring diversity perceptions in a community through a Q&A chatbot

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# Diversity is widely discussed, we have seen much scholarly criticism.

- Bardzell. (2010). Feminist HCI: taking stock and outlining an agenda for design. In *Proceedings of CHI2010*.
- Costanza-Chock, S. (2020). *Design Justice: Community-led Practices to Build the Worlds We Need*.
- Dankwa N.K., Draude C. (2021) Setting Diversity at the Core of HCI. In: *Universal Access in Human-Computer Interaction. Design Methods and User Experience*. HCII 2021. Lecture Notes in Computer Science, vol 12768.
- Fletcher-Watson, S., De Jaegher, H., Van Dijk, J., Frauenberger, C., Magnée, M., & Ye, J. (2018). Diversity computing. In *Interactions*, 25(5), 28-33.
- Himmelsbach, Schwarz, S., Gerdenitsch, C., Wais-Zechmann, B., Bobeth, J., & Tscheligi, M. (2019). Do We Care About Diversity in Human-Computer Interaction: A Comprehensive Content Analysis on Diversity Dimensions in Research. In *Proceedings of CHI2019*.
- Keyes, O. (2019) Counting the Countless: Why Data Science is a Profound Threat for Queer People. In *Real Life Magazine*.
- Matzner, T. (2019) The Human is Dead – Long Live the Algorithm! Human-Algorithmic Ensembles and Liberal Subjectivity. *Theory, Culture & Society*, 36(2):123–144
- Schelenz, L.; Reinhardt, K.; and Gjuraij, D. (2019) WeNet Deliverable 9.1: Developing a Conceptual and Ethical Framework of Diversity.

# What do we mean with diversity?

## Beyond surface-level attributes: deep diversity

Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond Relational Demography: Time and the Effects of Surface- and Deep-level Diversity on Work Group Cohesion. *Academy of Management Journal*, 41(1), 96-107.

But, what are **positive** use-cases for diversity?

And, what do people actually **expect** from diversity? How do they **perceive** it?



# Approach

# We deployed a technology probe as a research instrument.

(Research through design)

Hutchinson, H., Mackay, W., Westerlund, B., Bederson, B. B., Druin, A., Plaisant, C., Beaudouin-Lafon, M., Conversy, S., Evans, H., Hansen, H., Roussel, N., & Eiderbäck, B. (2003). Technology Probes: Inspiring Design for and with Families. In *Proceedings of CHI2003*.  
Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). Research Through Design as a Method for Interaction Design Research in HCI. In *Proceedings CHI2007*.  
Stappers, P. J., & Giaccardi, E. (2017). Research Through Design. In *The Encyclopedia of Human-Computer Interaction* (pp. 1-94). The Interaction Design Foundation.

Fully functional chat application – a  
Telegram chatbot.



# Research questions

*(Leading question)*

**RQ1:** What do people expect from being presented with diversity? How do people interpret diversity in use?

*(Contextual knowledge)*

**RQ2:** How do people perceive a chatbot that connects community members through diversity attributes?

*(Contextual knowledge)*

**RQ3:** What do student communities ask from others through a chatbot?

# Developing a Q&A chatbot

# Q&A chatbot – a “light interface”

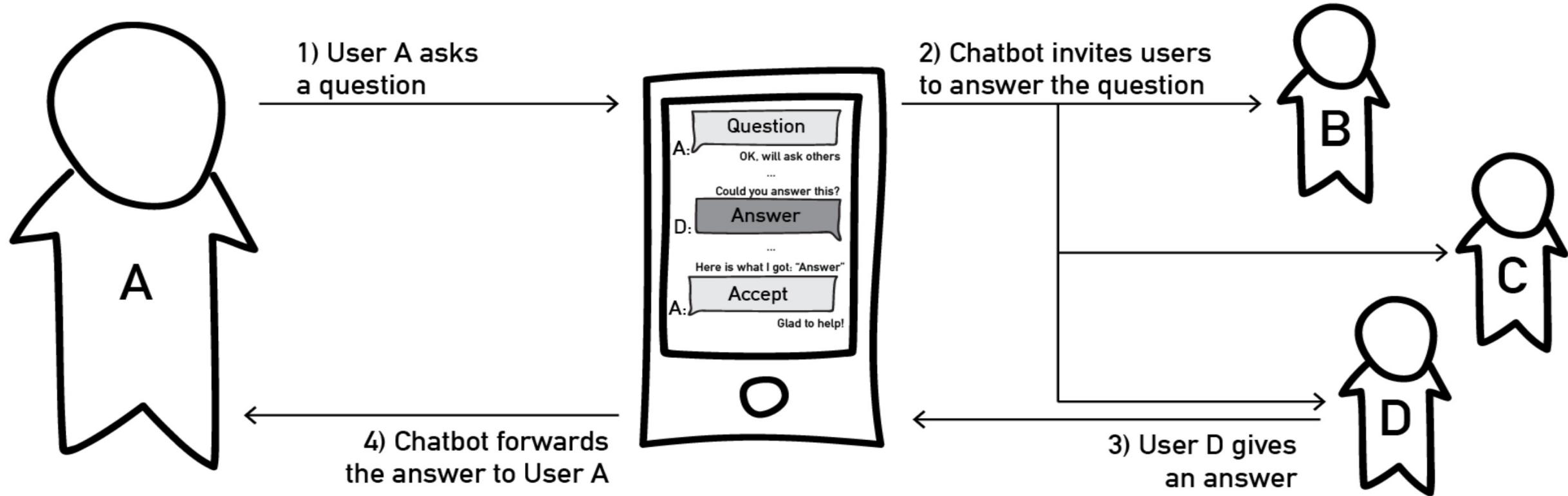
As a probe, enabled us to focus our research to the core

Q&A – simple interaction: asking questions, giving answers

Not a conversational agent, but a social recommendation system

Emphasize diversity in focus and copywriting

# User interaction



# Method



# Two pilot sites

Two weeks engagement with the chatbot in two pilot sites

N = 80 students participating overall

Total 669 questions asked and 2400 answers sent.



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# Overview

The screenshot shows a chat interface with a header bar containing a back arrow, a bot icon, the text 'Ask for help bot', a search icon, and a menu icon. The chat history includes:

- A green bubble from the user: '/question 11:23 ✓'
- A white bubble from the bot: 'What would you like to ask from the community members? 📌 11:23'
- A green bubble from the user: 'How do you manage your time during exam period? 11:25 ✓'
- A white bubble from the bot: 'Help my 🧠 algorithms, what type of people should I ask? 11:25'
- Three green buttons: 'Different than me', 'Similar to me', and 'Anyone'.
- A white bubble from the bot: '😬 Please help my researcher masters and tell why did you choose this kind of person? 11:25'
- A green bubble from the user: 'I hope to reach out to others that have similar study load, but has managed to deal with the struggle. 11:25 ✓'
- A white bubble from the bot: 'Alright, I will ask other users to answer your question! When I receive an answer, I will notify you. 11:25'
- A white bubble from the bot: 'You asked: "How do you manage your time during exam period?"'
- A white bubble from the bot: 'I have a new answer for you:'
- A white bubble from the bot: 'I try to timebox everything and schedule relax times with my partner to have proper breaks. But it's hard nevertheless - Anna 11:27'
- Three green buttons: '✅ I accept this answer!', '🗣️ Ask more people', and 'Report'.
- A white bubble from the bot: 'Glad I could help! If you need to ask another question, just use the /question command 🤗 11:27'

User asks a question.

## #1 Research data collection prompt

User needs to select what kind of other users she would like to answer.

## #2 Research data collection prompt

User needs to answer an open-ended question to give a rationale for her choice from the #1 prompt.

The chatbot forwards the question to other users.

User receives an answer that she can accept or request the chatbot to ask more people.

# Data collection and analysis

Thematic analysis from the log files (what did people ask and what answers they gave)

In-conversation research prompts

Exit survey and UTAUT2 instrument (technology acceptance)

Focus group interviews for qualitative support of interpretation of the quantitative findings



# Results



# RQ3: What do student communities ask from others through a chatbot?

Question type	Example question	Pilot A	Pilot B
Information	<i>"Is the [park] open?"</i>	4%	4%
Community	<i>"Are you thinking of staying in [city] after graduating?"</i>	54%	32%
Connection	<i>"Anyone interested in forming a study group?"</i>	0%	2%
Opinions and experiences	<i>What do you think about the vaccine delivery condition in [country]?</i>	14%	15%
Suggestion	<i>"Any fiction book recommendations?"</i>	22%	30%
Academic	<i>"Any tips for summer exams?"</i>	4%	14%
Personal or sensitive	<i>"Do you want to get married in the future? Do you want kids?"</i>	1%	3%
N		401	246

## RQ2: How do people perceive a chatbot that connects community members through diversity attributes?

From a social networking perspective, the one-shot interaction is very uncommon, clearly a polarizing topic.

People liked it because enabled “more private”, “refreshing” not to engage in a longer conversation (eager to help someone, not to engage)

People minded it, because annoying and interruptive for “real conversations”

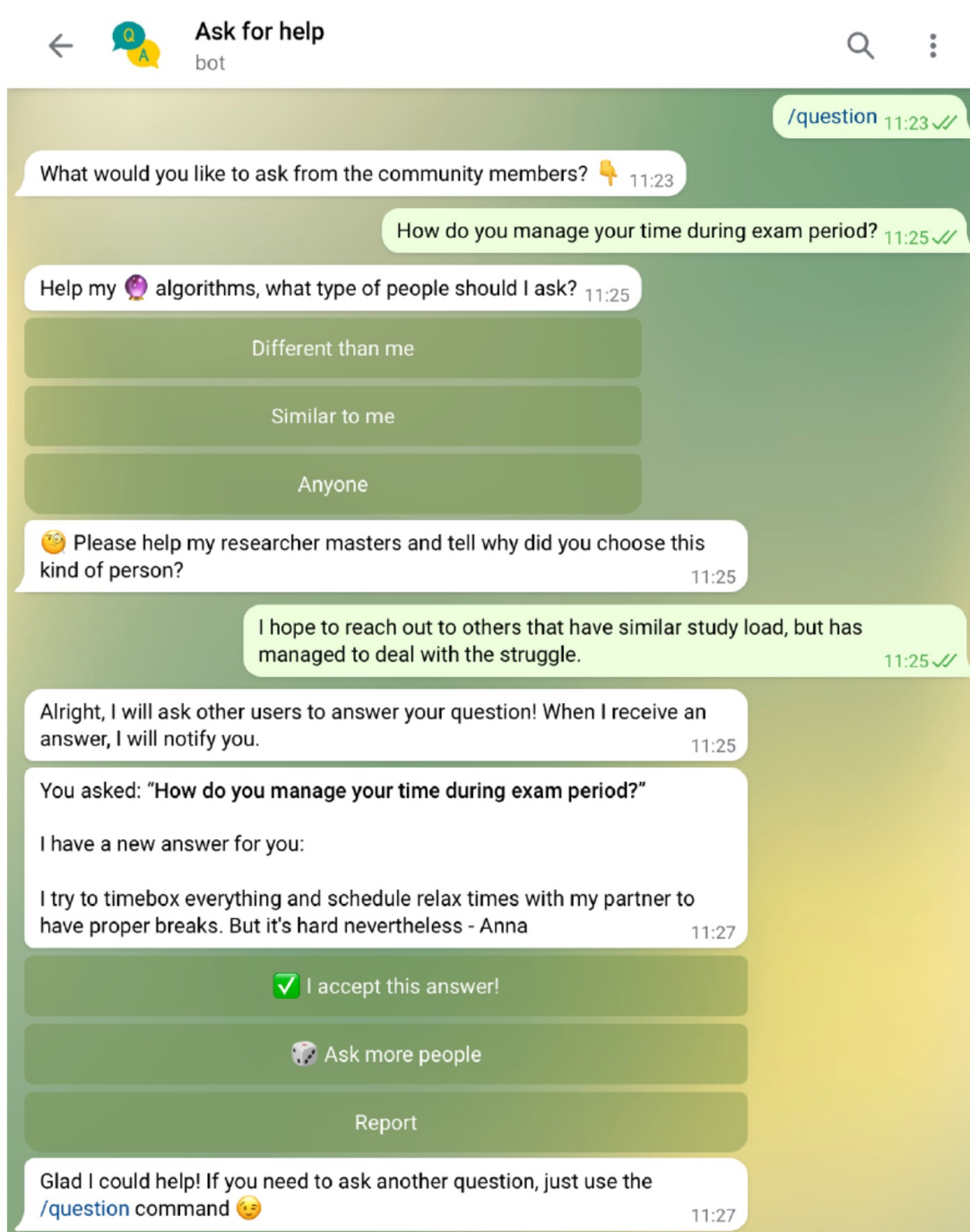
# RQ1: What do people expect from being presented with diversity? How do people interpret diversity in use?

From the in-conversation  
research prompts

Content analysis of open-ended  
answers for prompts

**“What type of people should I ask?”**

<b>Ask...</b>	<b>Pilot A</b>	<b>Pilot B</b>
Anyone	72%	74%
Different to me	8%	11%
Similar to me	20%	14%
N	402	257



User asks a question.

#### #1 Research data collection prompt

User needs to select what kind of other users she would like to answer.

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The chatbot forwards the question to other users.

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# RQ1: What do people expect from being presented with diversity? How do people interpret diversity in use?

Lots of “useless data” -->  
Choosing anyone, giving generic answer

Qualitatively interesting when someone made a “polarized rationale”

Category	Example	Similar	Different	Anyone	N
Taste	<i>“Because they have the same taste hopefully” (similar)</i>	22	4	-	26
Life experience	<i>“Wanted to know if they had similar jobs like me” (similar)</i>	5	5	-	10
How are other humans?	<i>“Nice to get opinions that may differ from your own” (different)</i>	14	17	-	31
Curiosity	<i>“For curiosity” (different)</i>	14	11	26	51
Concrete needs	<i>“Need a local” (different)</i>	-	10	-	10
Meta - chatbot	<i>“Not sure what it means, not sure how you have profiled me” (anyone)</i>	-	-	35	35
Study reasons	<i>“Would like to hear the opinion of other master students at [uni]” (similar)</i>	28	-	-	28
Self-identity	<i>“I want to ask others who are into video games” (similar)</i>	12	-	-	12
No filtering	<i>“Want to get as many answers as possible” (anyone)</i>	-	-	218	218
Diverse + more	<i>“I want to hear different points of view” (anyone)</i>	-	-	70	70
N/A	<i>“Masters” (anyone)</i>	18	12	126	156
N		113	59	475	

# Findings

When exposed to a system that targets diversity,

**People seek out to similar people, “their tribe” with niche interests.**



When exposed to a system that targets diversity,

**People seek out to different people driven by  
curiosity and serendipity**

(and not necessarily people with opposing views, as we expected)

Diversity-aware systems **need user profiling**.  
This is **paradoxical** with not wanting to  
normatively profile how people are different.

# Future work 🚀

**Next version of the chatbot implements a  
diversity-driven algorithm based on the findings.**

Instead of a randomized algorithm, resembling wizard-of-oz.

# **Next version of the chatbot is an improved version based on the findings of this study.**

Among these are user profiles with attributes for the algorithm, user agency in guiding the algorithmic matchmaking, asking sensitive or anonymous questions, etc.

**Next study with the chatbot takes place with five pilot sites around the globe.**

Including global south cultures, such as Paraguay and Mongolia.

# Thank you! Questions?

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