

CLUSTER

Brainstorming made visible.

Social and Mobile

Social

Group collaboration is **inherently social**, requiring communication and working towards a shared goal as a team. Our project encourages **democratic collaboration, open participation, peer recognition and shared authorship**. Overall, Clustr aims to facilitate brainstorming sessions, providing a novel and structured way for communication during teamwork.

Mobile/Contextual

With heavy focus on addressing issues in the university classrooms, the context of our solution is focused on **in-person brainstorming sessions**. Our project aims to incorporate technology into the traditional workflow of group discussions. This **hybrid approach** brings users away from their laptop screens and **encourages presence** in group discussions.

Problem Space

In **physical group brainstorming** today, **collaboration has become fragmented and screen-focused**. Participants often arrive with laptops or phones, typing ideas individually instead of engaging in real conversation. The energy of spontaneous dialogue is replaced by silent note-taking and **passive participation**. A few dominant voices tend to lead while quieter members withdraw, creating uneven contribution. Traditional pen-and-paper brainstorming, once tactile, social, and creatively open, has faded into the background, replaced by disconnected digital habits. As a result, **teams lose the sense of shared momentum and visibility** that once made idea generation collaborative. The creative process becomes isolated, less tangible, and less human, reflecting a **growing disconnect between people, ideas, and the spaces meant to bring them together**.



Background Research

Alternating between individual and group brainstorming (hybrid brainstorming) yields more creative and diverse ideas than either method alone. By combining social stimulation from group exchanges with the focus of solo reflection, the hybrid approach maximizes both idea breadth and depth.

When designing technology to facilitate social interaction, the **physical space, material artifacts, and social dynamics shape user experience**.

Design opportunity: How can we design a space that effectively shapes the social interactions that happen there?

Decades of research reveal that traditional brainstorming often suffers from issues like production blocking, dominance, and uneven participation. Studies on **group mirrors** and **metaphorical visualizations** show that playful representations **enhance awareness, balance participation, and increase motivation** by transforming feedback into engaging, intuitive experiences.

Target Audience

University Students
Working in Teams



Ethical Reflections

Designing for Accessibility:

For our project, students are given coloured post-its to contribute their ideas. However, we have not considered fringe users such as those who might be colour-blind, thus we risk excluding some users.

Design features are never neutral:

In our project, visualizing contributions through coloured petals highlight unequal engagement, and could potentially shame participants who contribute less, rather than motivate them. Future iterations should work on measures that can help equalise the power dynamics that arise due to unequal participation.

Our Solution

CLUSTER converts individual post-it contributions into digital clusters that grow into flowers.

Each color = participant, each cluster = theme, each flower = evolving idea group

As more post-its are added, flowers grow and merge, visually reflecting divergence (many small blooms) and convergence (fewer, fuller ones).

Provides a live visualization of participation, helping teams instantly see how ideas and engagement are distributed.

Challenge : Fragmented, screen-focused brainstorming

Encourages participants to step away from laptops, using tangible notes and shared visualization to bring attention back to the group.

Challenge : Uneven participation & dominance

Color-coded petals make contributions visible, motivating quieter voices and reducing hierarchy.

Challenge : Loss of collective awareness

The shared visualization acts as a group mirror, showing real-time balance and flow.

Challenge : Low motivation & engagement

The flower metaphor adds playfulness and ownership, turning collaboration into a rewarding experience.



Design Principles

Visibility: Everyone can see how ideas evolve.

Balance: Makes participation equality tangible.

Playfulness: Encourages exploration through metaphor.

Reflection: Captures each session as a visual milestone.

Hybrid Approach: Blends tangibility of pen-and-paper with digital clarity.

Setting Divergence Goals

More blooms mean more ideas, a sign of healthy, expansive thinking.

Tracking Convergence

As flowers merge, focus sharpens, ideas connect and meaning takes shape.

Turning Visuals into Insight

Reflecting on Participation

Color reveals contribution, making every voice visible and valued.

Capturing Progress

Each snapshot tells a story of growth, reflection, and creative evolution.

Using CLUSTER for Reviews

Visual cues help teams reflect on balance, focus, and participation during reviews

Future Directions

Accessibility: Accommodate fringe users such as those who are colour blind, by incorporating shapes for different representations instead of just colours.

Improved UX/UI: A more refined user interface can be integrated, which will provide a smoother experience.

Application: Implementing our solution in form of a mobile app that can connect to a screen. A standalone deployment including camera and screen is not as it will increase the barrier to entry and complexity

Inbuilt display: Instead of separating the activity and the visualization, we overlap them by clustering on the screen directly. This will need to be researched for its effectiveness



How to improve university student mental health?

Time: 577s

