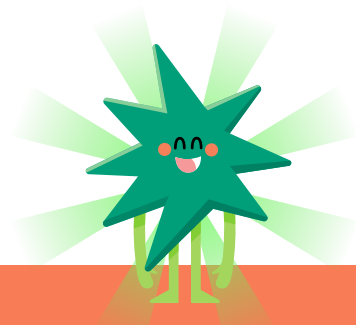




LUCERO



Increasing Access to Youth Mental Health Support

→ A wellness application for adolescents, co-developed by licensed therapists



Authors: Meagan Butler, MEd, LPC, and Chelsea Cornelius, PhD

WHITE PAPER

SUMMARY

LUCERO Increasing Access to Youth Mental Health Support

WHY LUCERO?

Today's youth are in crisis.

Research indicates that approximately half of all mental health conditions arise before the age of 14.¹ However, only about 10% of the millions of adolescents who experience a mental health issue receive therapy.² The concern is even greater now, as adolescents are struggling to recover from the collective trauma of the COVID-19 pandemic.

WHAT IS LUCERO?

Lucero is a research-informed wellness application for adolescents.

All Lucero content has been co-developed with and reviewed by certified clinical therapists who specialize in working with adolescents and families. These therapists drew upon many of the same psychological theories and frameworks that help inform their clinical practice.



HOW DOES LUCERO WORK?

Lucero is game-based and engaging.

Lucero invites users to set goals for themselves, implement healthy habits in the pursuit of those goals, and reflect on their progress, all while encouraging self-discovery and self-care.

IS LUCERO EFFECTIVE?

Yes! Lucero is having a significant impact on adolescents' mental health.

Comparison of participants' emotional intensity before and after completing the Lucero-generated activities revealed a significant improvement in mood. Sixty percent of participants reported feeling better. By learning to regulate their emotions, Lucero users not only feel better in the moment, but also experience a boost in confidence, believing in their ability to carry out the behaviors necessary for reaching their goals.

¹ Sharma et al. "Life in Lockdown: Child and Adolescent Mental Health and Well-Being in the Time of COVID-19," UNICEF Office of Research, 2021.

² Benjamin Zablotzky and Emily Terlizzi, "Mental Health Treatment among Children Aged 5–17 Years: United States, 2019," National Center for Health Statistics, 2020.

³ A dependent-samples t-test was conducted to determine if participants' emotional intensity declined after completing the Spark Wheel's emotional regulation activities. Results indicated that the average intensity rating post-Spark Wheel was significantly lower than the average intensity rating pre-Spark Wheel ($t(365) = 14.62, p < .001$).

INTRODUCTION

Lucero fills a current gap in behavioral health-care support for children.

Created by more than 50 licensed therapists, game designers, software developers, and youth, the Lucero application provides a radically supportive online space for self-discovery and self-care for tweens, teens, and their families. Lucero was developed by the Personal Excellence Foundation, which assists adolescents in reaching greater levels of mind-body-spirit consciousness and breaking down barriers for turning their purpose into action.⁴ Lucero's primary goal is to equip youth with the emotional regulation skills needed to unlock their confidence and actualize their potential.



**licensed therapists,
game designers,
software developers,
and youth created
Lucero.**

Lucero helps adolescents

- ✓ Learn emotional regulation skills
- ✓ Increase confidence
- ✓ Connect with supportive peers and adults

WHY LUCERO?

Today's youth are in crisis.

Research indicates that approximately **half of all mental health conditions arise before the age of 14.**⁵ However, only about 10% of the millions of adolescents who experience a mental health issue receive therapy.⁶ Due to long waitlists, youth who have been identified as needing professional support can go weeks or even months before receiving it.

With one in six teens experiencing a major depressive episode,⁷ and suicide being the second leading cause of death among people aged 10 to 14, the American Psychological Association agrees that it is “time to sound the alarm” on youth mental health.⁸ The concern is even greater now, as adolescents are struggling to recover from the collective trauma of the COVID-19 pandemic (Figure 1).

Teens are reporting increased....

- **Anxiety**
- **Depression**
- **Sadness**
- **Irritability**
- **Low energy**
- **Disinterest in activities**
- **Hopelessness**
- **Irregular Sleep**
- **Irregular Exercise**
- **Alcohol and substance abuse**
- **Anger**
- **Negativity**
- **Inattention**
- **Conduct problems**
- **Clinginess in younger children**
- **Screen Time**

Figure 1. Effects of the Pandemic⁹⁻¹¹

We also know that the quality of mental health during childhood and adolescence can have lifelong effects. For example, longitudinal studies of adverse childhood experiences demonstrate the lasting consequences on adults' mental health and their life expectancy.¹³ We need to act quickly to address the mental health of today's youth, but in-person therapy cannot be the only solution.

+ 31%

increase in mental health-related emergency department visits.¹²

Adolescents desperately need innovative, developmentally appropriate interventions they can access on demand. This is why tweens and teens need Lucero – a research-based mental health application - designed by licensed therapists to provide a radically supportive space for self-discovery and self-care.

⁵ Sharma et al. "Life in Lockdown: Child and Adolescent Mental Health and Well-Being in the Time of COVID-19." UNICEF Office of Research, 2021.

⁶ Benjamin Zablotsky and Emily Terlizzi, "Mental Health Treatment among Children Aged 5–17 Years: United States, 2019." National Center for Health Statistics, 2020.

⁷ National Alliance on Mental Illness, "2020 Mental Health by the Numbers," 2022.

⁸ Office of the Surgeon General (OSG). "Protecting Youth Mental Health: The U.S. Surgeon General's Advisory," US Department of Health and Human Services, 2021.

⁹ Sharma et al., Life in Lockdown, 2021.

¹⁰ Sharma et al., Life in Lockdown, p.5.

¹¹ National Alliance on Mental Illness, "2020 Mental Health by the Numbers," 2022.

¹² Centers for Disease Control and Prevention (U.S.). "During the Pandemic, Girls Ages 12-17 Had More Emergency Department Visits for Some Mental Health Conditions." CDC, 2022.

¹³ Vincent Felitti et al. "Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults." American Journal of Preventive Medicine, 1998.

WHAT IS LUCERO?

Lucero is a research-informed wellness application for adolescents.

All Lucero content was co-developed with and reviewed by certified clinical therapists who specialize in working with adolescents and families. These therapists drew upon many of the same psychological theories and frameworks that help inform their clinical practice.



- ★ Recognize & Name Emotions
- ★ Strengthen Community
- ★ Empower Healthy Choices

A foundational assumption of the Lucero app comes from Albert Bandura's social cognitive theory, which maintains that people learn to change their behavior, in part, through experiences of self-reflection on their emotions and thoughts.¹⁴ Before we can reflect on our emotions and how they affect our behavior, however, we must first be able to name our emotions. As Dr. Dan Siegel says, "Name it to tame it."¹⁵

Neuroimaging research shows that the simple act of labeling an emotion can diminish activity in the amygdala, an area of the brain responsible for processing emotional responses.¹⁶

Lucero not only helps users identify and name their emotions, it also provides a rich array of activities to help users learn to regulate their emotions.

Indeed, at its crux, it is a skills-based app that targets emotional regulation skills. Developing clients' emotional regulation skills is often one of the first priorities for clinical therapists who provide trauma-informed care to youth. Strengthening emotional regulation skills helps them learn that they can control their emotional state, thereby increasing their self-efficacy. In other words, when Lucero users can regulate their emotions, they not only feel better in the moment but also experience a boost in confidence, believing in their ability to carry out the behaviors necessary for reaching their goals.

¹⁴ Albert Bandura, "Social Cognitive Theory of Self-Regulation," *Organizational Behavior and Human Decision Processes, Theories of Cognitive Self-Regulation*, 1991, 248–87.

¹⁵ Dan Siegel: *Name It to Tame It*. Dalai Lama Center for Peace and Education, 2014.

¹⁶ Matthew Lieberman et al., "Putting Feelings Into Words." *Psychological Science*, 2017.

WHAT IS LUCERO?

If emotional regulation skills are the brain of the Lucero operation, then community is the heart.



Bandura noted that social support and guidance from others increase one's chances of long-term success.¹⁷ More recently, the National Child Traumatic Stress Network identified partnerships with family and community as the most difficult domain for youth's social-emotional learning.¹⁸ Lucero recognizes the importance of social support for coping and enacting behavioral change. As such, users are encouraged to share their progress and reflections with their "crew" of friends and caregivers who are also on the application.

“Lucero recognizes the importance of social support for coping and enacting behavioral change.”

When developing the structure and content of the application, Lucero's team of licensed therapists leaned into their expertise in Solution-Focused intervention,¹⁹ Trust-Based Relational Intervention,²⁰ Dialectical Behavior Therapy,²¹ the Neurosequential Model in Education (NME),²² and social-emotional learning.²³

Most of the activities were developed with facets of self-regulated learning (i.e., learning directed by the learner) in mind, such as goal setting, progress monitoring, self-reporting, attention focusing, help seeking, environmental structuring, and self-reflection.²⁴ Lucero's developers also collaborated with former storywriters from Disney and Mattel to create gamified graphics and developmentally appropriate storylines to maximize user engagement.

Additionally, Lucero developers followed the Designing for Children's Rights Guide²⁵ to best meet the unique needs of their target audience. Of particular importance were the following principles: gather and respect children's views, allow for support and exploration, and do not misuse children's data. Lucero staff facilitated focus groups with teens in the development of the application's content and design.

¹⁷ Matthew Lieberman et al., "Putting Feelings Into Words." Psychological Science, 2017.

¹⁸ National Child Traumatic Stress Network, "Supporting Trauma-Informed Schools to Keep Students in the Classroom" 2022.

¹⁹ Anne Lutz, "What is Solution-Focused Therapy" Solution-Focused Therapy Institute, 2023.

²⁰ Karen Purvis, "Trust Based Relational Intervention," Karen Purvis Institute of Child Development, 2023.

²¹ Marsha Linehan, "DBT Skills Training Manual. Second Edition," The Guilford Press, 2014.

²² Bruce D. Perry, "Neurosequential Model in Education," NMnetwork, 2023.

²³ Collaborative for Academic, Social, and Emotional Learning (CASEL), "What Is the CASEL Framework?" CASEL, 2023.

²⁴ Ernesto Panadero, "A Review of Self-Regulated Learning: Six Models and Four Directions for Research." Frontiers in Psychology, 2017.

²⁵ D4CR Association. "Designing for Children's Rights Guide," 2022.

HOW DOES LUCERO WORK?

Lucero is game-based and engaging.

Lucero invites users to set goals for themselves, implement healthy habits in the pursuit of those goals, and reflect on their progress, all while encouraging self-discovery and self-care. The app includes the following sections: Missions and Habits, Journey, Crew, and Spark.



Missions and Habits

Choose from 20 behavioral goals and complete 5-minute activities to accomplish them!



Journey

Travel on a self-discovery adventure to develop social-emotional learning skills.



Crew

Connect to crew members—trusting adults and friends who are also on the application



Spark

Practice self-care by generating multiple ideas for real-time emotional regulation.

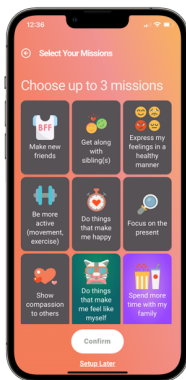
HOW DOES LUCERO WORK?

MISSIONS AND HABITS

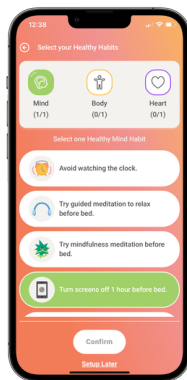
Lucero developers asked its team of licensed child therapists, “Which goals do you work on most often with your clients?” The Missions section of Lucero is based on those clinical goals. Users can choose from 20 behavioral goals such as “Get better sleep” and “Make new friends” (Figure 2). Lucero’s team of therapists designed a rich collection of 5-minute activities to support the accomplishment of these goals.

The activities represent the Habits section of Lucero, and users can choose whether to perform a habit that corresponds to the mind, the body, or the heart. For example, if the user’s goal is to “Make new friends,” the user might be prompted with suggested habits, such as “Think about the qualities of a good friend,” “Use positive body language,” and “When you meet someone new, find out what you have in common.” For each habit users complete, they earn a heart. Hearts can be used to win daily rewards within the app.

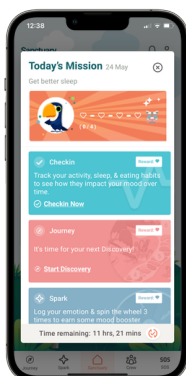
Choose your Mission



Set Healthy Habits



Check-in Daily



Track your Progress

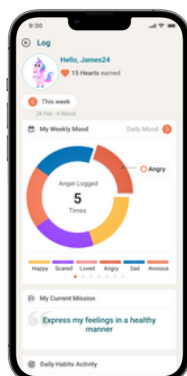


Figure 2. Missions & Habits

The Missions and Habits sections include two key features: check-ins and a progress tracker. The check-in feature asks users to reflect on habits that serve as the biological and environmental bases of mental health (e.g., eating, sleeping, movement, screen time). The results of check-ins are saved and displayed within the progress tracker at the end of each week. The objective of the progress tracker is to encourage self-reflection on the process of incorporating healthy habits to better accomplish goals. Users can choose to share their progress with their crew of friends and caregivers. The progress tracker also can serve as a springboard for conversations between caregivers and children.

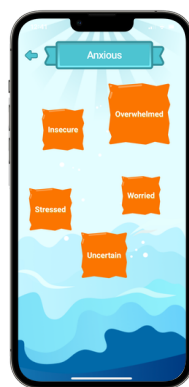
HOW DOES LUCERO WORK?

JOURNEY

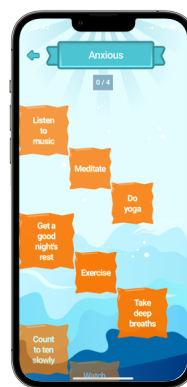
The Journey section of the Lucero app invites users to choose a personalized avatar and travel on a self-discovery adventure to Mente Island. Along the way, they are prompted to develop social-emotional learning skills, such as self-awareness, by identifying and naming their feelings. For example, during one Journey activity, a user might explore distinct types of anxious feelings, such as insecure, stressed, and nervous. Then the participant might play an interactive game, where they indicate which activities they like to do when they are anxious (Figure 3.) Later on the Journey, users are invited to practice their emotional regulation skills with instructor-led activities, such as a progressive muscle relaxation or a breathing exercise.



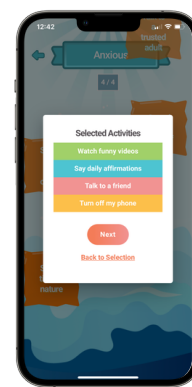
Journey Activity: Explore Anxious Feelings



Identify the Emotion



Explore Activities



Learn Coping Skills

Figure 3. Journey Activity Example

CREW



This section of the application invites users to connect to members of their crew—trusting adults and friends in their lives who are also on the application. Users can share “flare” with their crew members by sending them an inspirational message. Teens from the Lucero team created over 200 pieces of flare content to ensure the messages delivered to users are relevant and engaging. The Crew section of Lucero creates a space for the child, family members, and the community to build partnerships and communicate about their mental health.

HOW DOES LUCERO WORK?

SPARK

The Spark section of Lucero encourages users to practice self-care by generating multiple ideas for real-time emotional regulation. Lucero prompts users to provide “fuel for spark” by answering the question “How do you feel?” Users select one of the following core emotions that best matches their current mood: happy, scared, loved, angry, sad, or anxious.²⁶ These broad emotions can be found in the inner circle of Lucero’s feeling wheel (Figure 4).

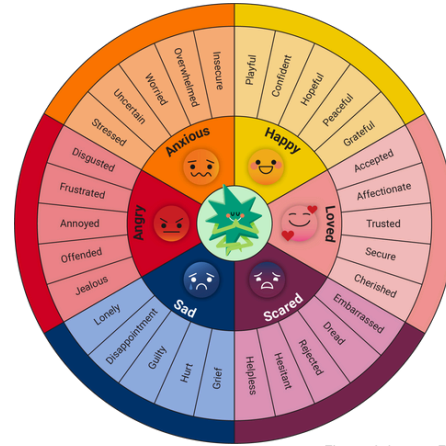


Figure 4. Lucero Feelings Wheel

After indicating which of the core emotions best resonates with them, users explore definitions of more nuanced versions of that core emotion. For example, if a user indicated they were feeling anxious, they would be presented with definitions such as “tense or on edge due to the demands, pressure or difficulties in my life” or “like there is too much to manage.” Users then select the definition that best corresponds to their emotion, and Lucero helps them name that emotion (e.g., “You’re feeling overwhelmed.”) These more nuanced emotions can be found in the outer circle of Lucero’s feeling wheel (Figure 4).

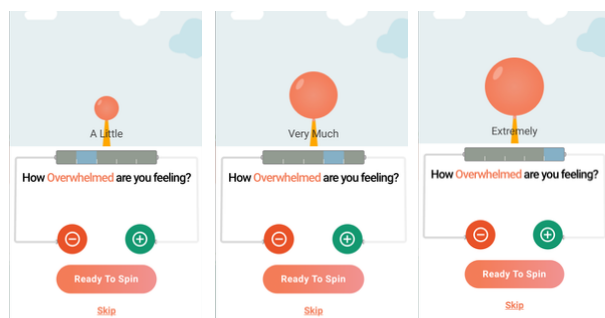


Figure 5. Ratings

After their emotion has been identified and labeled, users are prompted to rate the intensity of their emotion on an interactive Likert scale. Users can press a green or a red button to blow up a balloon to a size that corresponds to how much they are feeling the emotion, ranging from “not much” to “extremely” (Figure 5).

Next, users spin the Spark Wheel to generate an activity that will help support regulation of their specific emotion. For example, if a user is feeling stressed, they may be prompted with, “Move your body for 5 minutes. Try dancing or shaking off the stress!” After completing three to five of these self-care exercises, users are asked to rate the intensity of their emotion again, using the interactive Likert scale.



²⁶ These core emotions are based on Gloria Willcox’s “The Feeling Wheel: A Tool for Expanding Awareness of Emotions and Increasing Spontaneity and Intimacy,” *Transactional Analysis Journal*, 1982.

²⁷ Lucero’s measurement tool is based on a version of Wolpe’s Selective Units of Distress or “SUDS” Scale. Joseph Wolpe, “The Practice of Behavior Therapy. Pergamon General Psychology Series. New York: Pergamon Press, 1969.

IS LUCERO EFFECTIVE?

Yes! Lucero is having a significant impact on adolescents' mental health.

In the five months since Lucero launched, about 6,000+ individuals have created accounts, the majority of whom are teenage users. The Spark Wheel has been spun more than 20,000 times, and each week more than 300 users complete 1,500 emotional regulation skill-building activities in the application. Our user retention rates exceed that of other wellness applications.

6k

**New Accounts
with Lucero**

22k

**Spark Wheel
Spins**

1.5k

**Activities
Completed Weekly**

To better evaluate the degree to which Lucero supports adolescents' mental health, two studies were conducted. The purpose of the first quantitative study was to examine the effect of Lucero's feature on users' emotional regulation. The purpose of a second, qualitative study, was to hear from Lucero users about the contexts that motivate them to use the application, as well as the perceived effects of using the application.



Lucero creates a safe environment for kids and teens to explore and be themselves!

— Peyton
Youth Collaborator



SPARK'S IMPACT ON EMOTIONAL REGULATION

A pilot study was conducted on user data gathered from Lucero's Spark feature in the first quarter of 2023.²⁸ The primary research question was whether completing emotional regulation activities improved adolescents' mood, as measured by their self-reported intensity of negative emotions. Lucero users were included in the study if they met all of the following criteria:

- ★ Provided informed and voluntary consent
- ★ Were aged 9 to 18 years
- ★ Indicated feeling one of the negative core emotions (i.e., angry, sad, scared, or anxious) upon launching the Spark feature
- ★ Used the 5-point Likert scale to rate the intensity of their emotion
- ★ Completed at least three emotional regulation activities generated by the Spark Wheel
- ★ Used the 5-point Likert scale to rate the intensity of their emotion after completing the activities and within 24 hours of their initial intensity rating

Before using Spark

56% of participants were dealing with negative emotions

88% reported their negative emotion to be at a moderate to high intensity

All participants used the Lucero application in English on a smartphone. Race, gender, and other identity factors were not collected. For analysis purposes, participants were assigned a user number to maintain confidentiality. Lucero ensured compliance with the Federal Trade Commission's Children's Online Privacy Protection Rule, (COPPA).²⁹

In total, 652 sets of pre- and post-Spark Wheel emotional intensity ratings were collected from participants. Of these, 56% (n = 366) were for a negative emotion.³⁰ It is notable that most of the participants (88%) reported their negative emotion to be at a moderate to high intensity level (i.e., > 3) before spinning the Spark Wheel.

²⁸ Data for this study were collected between January 1, 2023 and April 12, 2023.

²⁹ Federal Trade Commission. Children's Online Privacy Protection Rule (COPPA) (1998).

³⁰ Data from the 286 users who reported positive emotions were excluded from analysis, as the primary focus of this study was whether users' negative mood improved.

SPARK'S IMPACT ON EMOTIONAL REGULATION CONT.

Analysis of participants' emotional intensity upon completing at least three Spark Wheel activities indicated that the application was successful in helping users regulate their emotions.

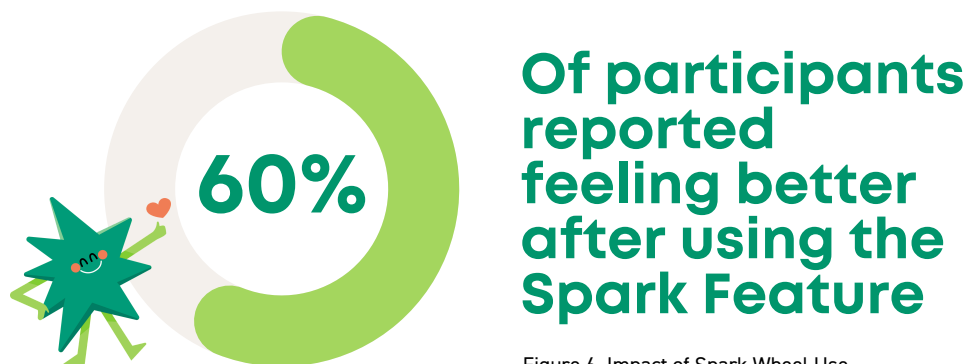
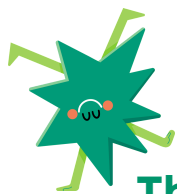


Figure 6. Impact of Spark Wheel Use

Specifically, 60% of participants reported feeling better (Figure 6). Comparison of participants' emotional intensity before and after completing the Spark Wheel activities revealed a significant improvement in mood.³¹ On average, the intensity of adolescents' negative mood decreased by nearly 1 point after completing the emotional regulation activities generated by the Spark Wheel.



These pilot data show that Lucero is helping adolescents regulate their emotions. Future research will explore Lucero's success at providing other facets of mental health support to youth.



³¹ A dependent-samples t-test was conducted to determine if participants' emotional intensity declined after completing the Spark Wheel's emotional regulation activities. Results indicated that the average intensity rating post-SparkWheel was significantly lower than the average intensity rating pre-Spark Wheel ($t(365) = 14.62, p < .001$).

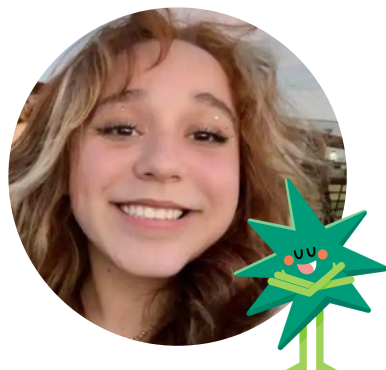
RESULTS OF FOCUS GROUP ON LUCERO

Researchers conducted a series of focus groups with Lucero's teen and tween users in February and March 2023, and several themes emerged.

First, school stress was mentioned by participants in every school level (i.e., elementary, middle, and high school.) For example, an 11th grader named Madison shared, "I did find that with COVID, with being home all the time, I feel like my social battery went down a lot. And it's like it doesn't hold as much as it used to. So having to go to school, I was getting super overstimulated and overwhelmed." The experiences of Lucero's teen and tween users aligned with national mental health trends, such as an increase in anxiety and decrease in sleep. Several participants reported that they wanted more support at school and requested that their schools start using Lucero during class or counseling groups.

"I did find that with COVID, with being home all the time, I feel like my social battery went down a lot. And it's like it doesn't hold as much as it used to. So having to go to school, I was getting super overstimulated and overwhelmed."

— Madison
Youth Collaborator



Many of the high school users recognized Lucero's objective to help them feel better by employing their emotional regulation skills. They reported that they wanted to practice more self-care, and Lucero helped generate fresh ideas for them. For example, an 11th grader named Journi shared, "I never really knew what to do for self-care. So I like having a place where it tells me different things I can do...I started trying to incorporate that."

RESULTS OF FOCUS GROUP ON LUCERO

Some participants described using the application primarily by themselves to wind down at night or in the morning before school, while others reported they used the application to connect to others. For example, a 6th-grade student named Hope said she liked posing the self-awareness questions to her peers, stating “Whenever I’m in a room with others, I like to ask them, ‘What do you think about this question? What would your answer be?’” She also enjoyed the Crew section of the application, stating, “When my mom sent me flares, it helped me bring back my smile.” All of the high school users in the focus group admitted that they had been “spamming flares” to their friends and sending them frequent messages of encouragement.

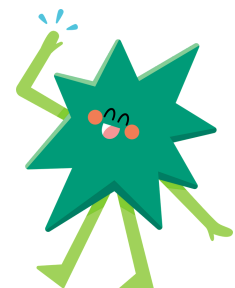
Focus group participants also noted the role of self-reflection in goal setting and progress monitoring. For example, 5th-grade student Jeter shared, “Lucero helped me understand and reflect how I’m doing in school and what I could do to help me be better...I haven’t been eating in school, which has been affecting my behavior.” A high school student echoed the sentiment, saying:

“You're forced to reflect; here are the healthy ways that I can deal with this emotion. And then, I can apply that later on.”

— **Journi**
Youth Collaborator



Finally, comments about the app's design features were overwhelmingly positive. Many participants commented on design details, such as the color scheme and the spinning sound of the Spark Wheel. **The most common word used to describe Lucero was “cute.”**



WHAT'S NEXT FOR LUCERO?

Lucero was designed to fill a gap in behavioral health support and remove barriers to mental health support access.

We know that millions of adolescents cannot access the timely support they desperately need. Thus, we are building relationships with corporate sponsors and offering group licenses with the goal of providing free access to as many tweens and teens as possible. Additionally, we are exploring potential research partnerships to further investigate the positive impact of Lucero on youth mental health. If you are interested in having a conversation about Lucero, please email us at support@lucerospeaks.com

ABOUT THE AUTHORS

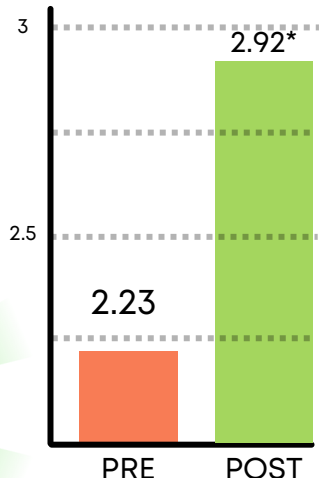
Meagan Butler, M.Ed, LPC is the Chief Care Model Officer for Lucero. She designed the care model for the application and the research plan for this white paper. Meagan is also a Senior Therapist for children and adolescents at Ensemble Therapy in Austin and led a team of therapists to create content for Lucero based on therapeutic skills. Meagan specializes in neuroscience-based interventions and trauma-informed practices; she is a Neurosequential Model in Education Trainer, Trust Based Relational Intervention practitioner, and is trained in Dialectical Behavior Therapy for Adolescents. She has 17 years of experience as a public school teacher, counselor, and counseling administrator, and was named Austin ISD's District-wide Counselor of the Year in 2015. She practices mindfulness everyday.

Dr. Chelsea Cornelius is a developmental psychologist who specializes in applied research. She currently supports various organizations with the evaluation of their products and programs, most of which are aimed at improving child and caregiver well-being. Chelsea lives in Austin, Texas with her partner and two children.



Lucero is a modular system that improves mental health support for youth and their families

Significant Increase in Youth Taking Action and Trying Activities to Boost Mood



Youth who used Lucero for 2 weeks showed statistically significant improvement in multiple areas relating to empathy and mental health skill building. Lucero continues to demonstrate effectiveness.

100% of youth say Lucero is helpful

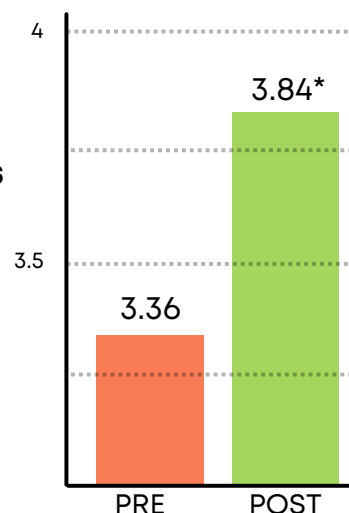
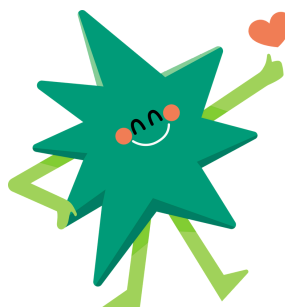
in app user survey, Dec 2023-Jan 2024

18,000+ youth supported

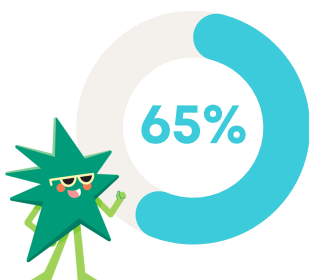
Lucero continues to show extremely **high youth engagement**. By leveraging youth input from the beginning, Lucero's game-based format is relevant, and the retention rate outperforms competitors. Youth continue to give overwhelmingly **positive feedback** on in-app activities.

"I feel better!"

Significant Improvement in Caring About Others' Feelings



*According to Lucero in-app data survey of super users, Dec 2023-Jan 2024, after 2 weeks time. p value=.015



of users report reduction in intensity of negative feelings after using "Spark" self care wheel

n=2,254 surveys, Jan 2024



100% approval rating on over 200 activities

(in app survey of over 30,000 votes, Jan 2024)