EMOTIF

Designing a CBT and Experiential Learning-Based Mobile App for Self-Guided Emotion Regulation

Capstone Thesis for Fall Semester 2025

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Acknowledgment

Salutation

This capstone project was a significant undertaking, and its completion would not have been possible without the support and contributions of many people.

First and foremost, I wish to express my profound gratitude to my advisor, Professor Camillia Matuk, for her invaluable mentorship to explore my ideas while providing the insightful guidance necessary to focus my research and bring this project to fruition.

My sincere thanks also go to participants who generously dedicated their time in interviews and usability testing sessions. Your willingness to brainstorm and critique, along with your encouragement, sustained me through the challenges of this process.

Finally, I extend my gratitude to my personal network for their unwavering support throughout this demanding journey. It is my sincere hope that the insights from this work may prove useful to other designers and researchers in the EdTech community as we collectively strive to create more empathetic and effective learning technologies.

AI Usage

In the creation of this document, AI tools were used selectively throughout this project to support both the research and writing processes, with the author retaining full control over content development and decision-making. Specifically, I employed Google's Gemini to synthesize information from the process documents, organize the paper's structure according to academic standards, and Grammarly AI to identify clarity and grammar issues. The AI was used for the following purposes:

- Literature Synthesis: To review and integrate content from the project website and project folder documents into an outline of the thesis paper.
- Clarity and Grammar Improvement: To review the content and check for grammar errors/ expressions that might be unclear or redundant.
- Formatting and Referencing: To ensure the document adheres to APA 7th edition formatting guidelines for citations, headings, and the reference list.

I hereby declare that all AI-generated content was critically reviewed, edited, and revised to ensure it reflects the project's goals, research process, and my own authorial voice.

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1. Introduction

1.1 Problem in a Nutshell

In the current climate of high external pressure and life complexity, people are overwhelmed by emotional volatility, which creates significant roadblocks to personal and professional success. While many are aware of and attempt various coping strategies, they often fail to maintain consistent, effective self-care practices. Therefore, this project aims to examine and address this issue by creating an intuitive, supportive, and personalized digital tool specifically for on-the-go event-based emotion recognition and regulation.

1.2 Context

Globally, we are in an "emotional recession" (Freedman et al.,2024), a phenomenon marked by a sustained decline in emotional energy and intelligence. This climate results in people feeling less empathetic, less optimistic, and struggling to accurately identify and label their feelings—a cornerstone of mental well-being. This macro trend creates an environment where young adults, who are at a critical developmental stage for learning emotion regulation, are particularly vulnerable.

The modern world has entered what Freedman et al. (2024) term an "emotional recession," characterized by a sustained global decline in emotional intelligence (EQ) and well-being since 2019. This decline manifests as reduced emotional energy, increased volatility, and a diminished capacity for individuals to navigate their emotions effectively. People across the globe report feeling uncertain about the future, less empathetic, and struggle to accurately understand and label their own feelings—a foundational skill for mental health.

This emotional crisis is particularly acute among young adults. Gen Z, for instance, has experienced a 12% drop in the ability to navigate emotions and faces high rates of loneliness, self-criticism, and burnout, despite high levels of achievement. They often resort to short-term coping mechanisms rather than developing sustainable, long-term strategies for emotional wellness. This underscores the urgent need for accessible and effective interventions designed to enhance emotion regulation (ER), the process where individuals "influence which emotions they have, when they have them, and how they are experienced and expressed" (Gross, 2015, p. 6).

2. Methods

2.1 Design Process

To ensure the final product is both user-centric and effective, this project employs a hybrid design framework, as shown in the roadmap above, that combines the Double Diamond Model and Seels & Glasgow's Instructional Systems Design (ISD) Model.

Double Diamond Model

This user-centered model ensures the solution genuinely meets user needs by first diverging to explore the problem space broadly (Discover) and then converging to define the core issues (Define). This is followed by a second divergence to develop a wide range of potential solutions (Develop) and a final convergence to deliver a tested and refined product (Deliver).

Seels & Glasgow's ISD Model

This product-oriented model provides a systematic approach to designing effective learning solutions. It emphasizes clear objectives, rigorous analysis, and structured evaluation to ensure high-quality and measurable learning outcomes.

1	2	3	4
Analysis	Define	Design	Development
Problem Analysis	Opportunity Area	Ideation	Media Development
Needs Analysis	Goal & Objective	Concept Testing	Material Development
Learner Analysis		Assessment Strategy	Usability Testing
Task Analysis		Learning Activity Design	Evaluation & Iteration

2.2 Research Methodologies

Building on the design process, I further laid down a series of research methods in each of the four stages to ensure a deep understanding of the user while maintaining a structured path toward an effective educational tool.

In the first half of the project, desktop literature review, 1-on-1 user interview and concept testing via survey are the main methods to understand user's needs and expectations on digital emotion regulation experience.

In the second half, with an MVP developed, concept testing via SME and usability testing are conducted to gain expert and user feedback on the learning design feasibility, user flow, and visual appeal.

Literature Review

The project benefited from a comprehensive desktop research to investigate empirical studies and researches on ER, EQ, emotion regulation, affect recognition, self-reflection, mindfulness, journaling, and use of AI technology in mental health. Drawing on over 70 studies, the review layed a solid foundation of further research and design works.

1-on-1 User Interviews

In-depth interviews were conducted with young adults to understand their current mental wellness status, coping mechanisms, and pain points related to emotion regulation. The data was then organized using an affinity map to identify key themes.

Concept Testing Session on Digital Journaling Practices

An online survey was conducted to gauge the target audience's familiarity with and behavior towards journaling, test 3 initial concepts, and to identify potential barriers to or expectations for interaction and engagement.

Concept Testing Session on LX Design

A second concept testing was conducted to gain insights from SME and target users related to emotional wellness, instructional design, and AI usage for education. Four online interviews and follow-up text-based communication is used to gather expert feedback on the theoretical soundness, developmental appropriateness, and potential efficacy of the app concept, specifically focusing on its application for young adults.

Usability Testing

Two focus groups were conducted to gain qualitative feedback on the user flow, features, and general digital experience in terms of whether they are necessary, helpful, interesting, and engaging. Meanwhile, it also serves to validate the integration of expert-recommended safety protocols, the decoupled emotion labeling process, and the new creative features.

3. Analysis & Insights

3.1 Need

The desktop and qualitative research confirms a critical and pressing need for a structured emotion regulation tool among young adults. This need is rooted in two intersecting issues: the broader societal context and the specific internal challenges faced by this demographic.

On a Micro-Level: Emotional Volatility & Barriers to Self care

User interviews reveal that this vulnerability manifests as mainstream emotional volatility. “I feel like everyone’s quite stressed now and then.” said an interviewee. These young adults report frequent struggles with anxiety, stress, loneliness, self-criticism, and guilt. These feelings might not be consistent but recur periodically. As one interviewee noted, “It keeps jumping back and forth…between depressed and fine. When I am alone at night, I always reflect on the events happening in the day and their outcome…And I start to think about: Did something go wrong? Or did I do something wrong?”

As highlighted by 5 out of 6 interviewees, certain categories of events such as relocating and networking can concur and recur along their personal development, which brings forth an opportunity for optimizing the coping mechanism along the way and eventually improve learners’ performances in future events.

These negatively impactful feelings (as described in the interviews) are primarily triggered by four influence categories:

Life Transitions

Navigating college, internships, and new careers creates significant stress.

“There’s no one most outstanding case, in high school I’m stressed about grades, last year it was the graduate program application, and recently it’s about internship…”

Uncertainty

The pressure to succeed or achieve certain goals

“I felt so lost this summer. There’s no structure in my life compared to friends who are working.” “[The source of my anxiety] Varied a bit but overall it’s for things that I can’t fully control – travel plan, immigration application…”

Social Stress

Build community or bonding with people.

“Starting to feel homesick. I’m building community intentionally but still finding my feet.”

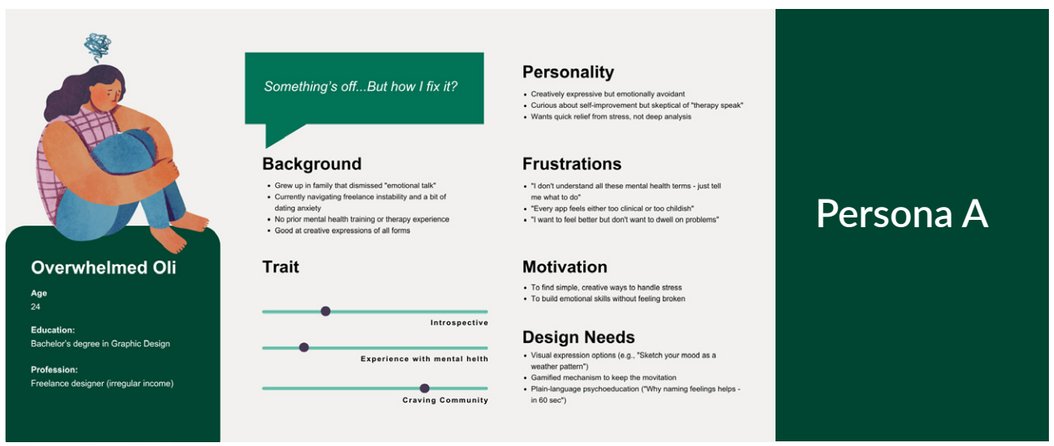
Personal Inferiority Complex

Feelings of inadequacy, negative self-perception and inadequet recognition.

“I had body dysmorphia and I’m still dealing with being self-critical...I question myself a lot.”

3.2 Audience

The target audience for this tool consists of students and young professionals who are navigating life's complexities and are actively seeking tools for self-improvement and emotional clarity. Two personas, "Overwhelmed Oli" and "Insecure Ian," were developed to represent these audience segments.



Overwhelmed Oli is a 24-year-old freelance designer who is creative but emotionally avoidant. She seeks simple, creative ways to handle stress but finds most mental health apps to be either too clinical or too childish. Her primary motivation is to find quick relief without deep analysis.

Insecure Ian is a 32-year-old financial analyst who is highly self-aware but emotionally fatigued. He has experience with therapy and meditation but finds most journaling apps too simplistic for his needs. He is motivated to find emotional boundaries and deepen his professional knowledge through reflective practice.

3.3 Activity (Task)

3.3.1 Challenges

Both the preliminary studies and the user interviews reveal that most users already engage in evidence-based emotion regulation practices, including:

- Mindfulness practices (e.g., box breathing) to modulate physiological arousal and foster present-moment awareness (Gross, 2015; Teper et al., 2013).
- Journaling for emotional expression and cognitive processing of experiences (Ullrich & Lutgendorf, 2002; Smyth et al., 2018).
- Self-reflection, often through internal dialogue or writing, to increase self-awareness (Kross & Ayduk, 2011; MacIsaac et al., 2023).
- Seeking social or professional support for validation and guidance.

Despite empirical research clearly validating the efficacy of these activities, most interviewees still emphasize they face significant barriers (four most outstanding ones listed below) that prevent consistent practice while using these techniques. I'm surprised to find all of these barriers also highlighted in empirical studies, which means that despite the effort and dedication, the needs of struggling individuals are not fully met, or their needs have evolved beyond the offering of existing offerings.

Therefore, I aimed to reexamine the existing practices, identify the ones that are most relevant in the modern context, and efficiently leverage diverse techniques that aim to promote emotional regulation while meeting the new needs.

Lack of structure and guidance, which hinders consistent and deep engagement (MacIsaac et al., 2023).	Structure
Feelings of insecurity and privacy concerns reduce authentic sharing (Henson et al., 2019).	Security
Digital distractions disrupt sustained focus necessary for emotional processing (Martinez, 2010).	Low Effort
Risk of maladaptive rumination, where unguided self-reflection intensifies distress (Nolen-Hoeksema, 2000; MacIsaac et al., 2023).	Self-guidance

3.3.2 Journaling as a Core Activity

Journaling, in its broadest sense, is a tool associated with profound physiological and psychological benefits. Peer-reviewed research, substantiated by over three decades of clinical studies, confirms that regular therapeutic writing can lead to significant mental health improvements, including a reported 20 to 45% reduction in symptoms of depression and anxiety, improved immune function, and enhanced cognitive performance (Sohal et al., 2022). Moreover, multiple research shows focused journaling interventions enhance both intrapersonal and interpersonal characteristics, resilience, and self-efficacy (Fritson, 2008; Smyth et al., 2018). It incorporates cognitive processing and emotional expression to develop greater awareness of the positive benefits of the stressful event compared to solely negative emotional expression or factual writing (Ullrich, 2002; Stapleton et al., 2021). Such an action of writing about a difficult event helps build resilience by making writers emotionally stronger, less upset, and less cognitively avoidant when the same event repeats in the future.

However, not all therapeutic writing is equally effective.

There's a crucial distinction between unstructured Expressive Writing (EW) and the highly structured methodologies of Cognitive-Behavioral Writing Therapy (CBWT). While EW has proven utility, particularly for emotional disclosure, recent meta-analyses examining EW's use in clinical and psychiatric populations have yielded mixed or limited benefits, suggesting that catharsis alone may be insufficient for complex clinical presentations (Pascoe, 2016). CBWT protocols, on the other hand, specifically instruct individuals not just to write narratives of previous trauma or distress but explicitly to alter these narratives using cognitive restructuring techniques (Pascoe, 2016), which will be introduced in the later section.

The effectiveness of self-guided, structured written protocols is robustly supported by research into Internet-delivered CBT (iCBT). Pivotal studies have demonstrated that structured self-help interventions possess superior long-term efficacy compared to control groups (Mamukashvili-Delau et al., 2023) and web-based, self-help CBT treatment providing short-term efficacy for reducing depressive symptoms (Andersson et al., 2005). The ability of written, structured, self-help material to produce clinical outcomes comparable to or better than control conditions reinforces the viability of the protocol as a potent intervention, regardless of direct therapist involvement (Mamukashvili-Delau et al., 2023; Zandieh et al., 2024). Such success of iCBT validates the proposed self-guided written format as a powerful, empirically supported delivery mechanism for core CBT techniques, overcoming barriers of access and cost (Sohal et al., 2022; Mamukashvili-Delau et al., 2023; Zandieh et al., 2024).

3.3.3 AI as a Scaffold

Broadly speaking, empirical studies show Artificial Intelligence (AI) plays a pivotal role in scaffolding emotion regulation activities by providing personalized, non-intrusive support that enhances user engagement and learning. Integration of AI within the app facilitates several key functions:

Pattern Identification & Insight Generation

AI analyzes journal entries and mood data to detect emotional patterns (e.g., anxiety spikes before deadlines) that users may not readily perceive. This supports inductive reasoning by helping users identify underlying emotional structures and triggers (Martinez, 2010; Graham et al., 2019).

Personalized Nudges & Recommendations

AI delivers timely, tailored suggestions, such as mindfulness exercises or customized journaling prompts, aligning with the user's current emotional state and history. This adaptive feedback guides users through experimentation with coping strategies without overwhelming cognitive resources (Olawade et al., 2024; Lee et al., 2021).

Reducing Cognitive Load

Automating synthesis and interpretation of mood and journaling data decreases cognitive burden, enabling users to focus energy on meaningful self-reflection and skills practice (Sweller, 2011; Mayer, 2020).

Enhancing Accessibility & Sustainability

AI-powered guidance provides scalable, continuous emotional support, supplementing traditional care and helping overcome barriers such as stigma and provider shortages (Graham et al., 2019; Olawade et al., 2024).

Despite AI's benefits, its deployment in emotional regulation apps carries limitations necessitating cautious application:

Accuracy and Context Sensitivity

AI lacks human empathy and may misinterpret nuanced emotional expressions, risking inappropriate feedback (Graham et al., 2019).

Over-Reliance

Users might become dependent on AI guidance, potentially reducing self-agency in emotion regulation (Olawade et al., 2024).

Bias and Equity

AI algorithms may inadvertently perpetuate biases present in training data, requiring continuous monitoring and inclusive design practices (Lee et al., 2021).

Privacy

Any data breach could severely impact user trust and safety, hence demands for robust encryption and strict compliance are paramount (Henson et al., 2019).

3.4 Landscape & Competitors

3.4.1 Existing Solutions

The market context for therapeutic journaling apps is defined by the rapidly expanding Digital Mental Health sector. The global digital mental health market was valued at $27.80 billion in 2024 and is projected to reach $180.56 billion by 2035, reflecting a Compound Annual Growth Rate (CAGR) of 18.54% (Market Research Future, 2024). The mental health apps segment alone was estimated at $7.48 billion in 2024 and is projected to reach $17.52 billion by 2030, growing at a CAGR of 14.6%, driven primarily by demand for depression and anxiety management tools used in homecare settings (Grand View Research, 2024; Fortune Business Insights, 2024). This growth confirms a vast and motivated user base seeking accessible self-help tools. However, an audit of existing mental health and journaling apps revealed an opportunity space for a more integrated and insightful tool.

	Key Characteristics	Relevance
Direct Competitors	Mood tracking, journaling, CBT exercises	Reveals standard features, common UX patterns, and gaps in guidance/personalization.
Indirect Competitors	Guided mindfulness and meditation, sleep support	Benchmark for engagement, teaching methods, and audio/visual experience. Often lack event-based processing.
Behavioral Management & Habit Apps	Gamification, reward systems, progress tracking	Insights into motivational design (streaks, badges) that promote consistent engagement and self-management skills.

3.4.2 Gaps

Through observatory research examining the user feedback and editorials into the listed solutions, there are four outstanding gaps that could potentially interfere with learner's effective self-care when practicing on these tools.

Lack of streamlined, evidence-based methods

that focus on event-based emotion regulation. While many tools offer a comprehensive library of resources and approaches that could be helpful for different challenges in the mental health realm, few focus on specific fields. For instance, Headspace, a mindfulness and meditation app, offers a variety of features designed to improve mental well-being but such a bold library of high-quality guided meditations, research-backed content can be overwhelming for beginners who seek remedy recommendations.

Heavy reliance on manual externalization

which can be challenging for learners to commit and sustain the effort. Grid Diary, for example, offers a comprehensive journaling experience to track areas of life, building planner systems, and reflect under guiding prompts on a daily basis. However, such heavy labor might not be achievable for learners experiencing complex lives and busy schedules.

Lack of individualized scaffolds

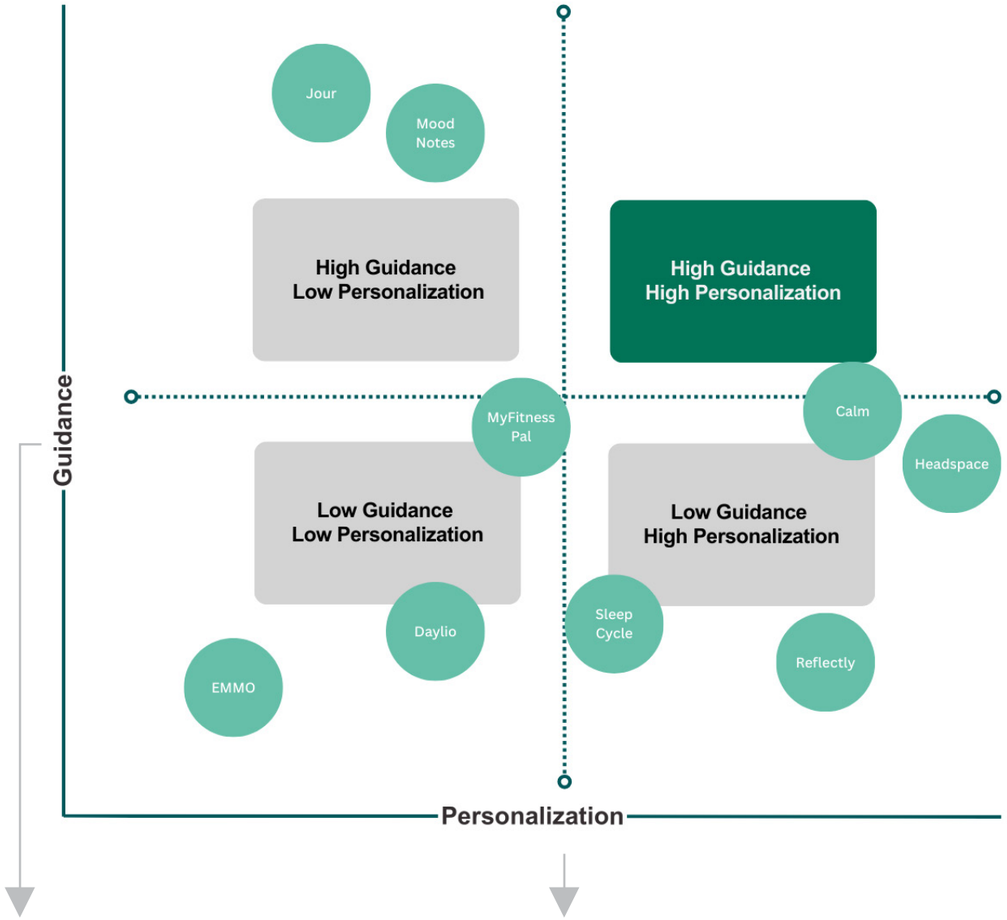
This is an area/opportunity for learners to develop self-paced learning processes and meaningful learning experiences. AI-powered insight generation and guidance is a key aspect to consider. Some current applications lean on extensive application of NLP to scaffold learners' reflection, which might interfere with their critical thinking, problem-solving, and subjectivity in decision making. Afterall, emotion regulation is a highly personal matter that should allow diverse, personal interpretations rather than robotic conclusions.

Overly rigid format limitation

for practices & documentations can discourage learners' constructive learning (active learning based on their own understanding and knowledge rather than passively following the grids). Consider the varying effect of different journaling practices on individuals, it is important to leave room for personalization while following an evidence-based activity flow.

3.4.3 Opportunity Space

To help identify how my tool could provide a unique offering, I created a competitive matrix to synthesize the analysis and highlight my solution's strategic position:



Y-Axis
Level of Guidance & Structured Learning

Low: Apps offering basic, free-form tracking with little to no instructional framework (e.g., Daylio).

High: Apps that provide a clear, evidence-based framework (like CBT) to guide users through emotional processing (e.g., Jour).

X-Axis
Level of Automation & Personalization

Low: Apps that rely primarily on user manual input and analysis; insights are not automated or tailored.

High: Apps that use AI or algorithms to analyze user data, provide personalized insights, nudge with relevant exercises, and adapt to individual patterns

This matrix clearly illustrates that most current apps occupy three quadrants, leaving a significant gap for a solution that combines high guidance with high personalization, an opportunity for my tool to fill by being more than a tracker—it is an adaptive emotional guide. Its unique position is defined by:

Socratic AI Scaffolding

Using AI not just to report data, but to ask probing, open-ended questions that promote cognitive restructuring and self-discovery.

Event-Based Learning

Anchoring exercises in real-life events, making emotional regulation contextual and practical.

Balanced Lifestyle Experience

Merging the clinical rigor of apps like Jour with the adaptive, engaging feel of apps like Reflectly, without being overwhelming.

4. Proposed Solution

4.1 Goal & Objectives

The learning objectives follow the step-by-step learning process described in Bloom's Taxonomy (Anderson & Krathwohl, 2001), and also align with Fink's Taxonomy (2013), which highlights the importance of not just cognitive learning but also caring about the learning, connecting it to one's life, and learning how to keep improving.

Learning Goal

Empower young adults to achieve self-guided, sustainable improvements in their emotional well-being by mastering a structured process of cognitive-behavioral journaling.

Learning Objectives

Foundational Knowledge & Emotional Literacy

Identify and label their emotional states with increased granularity, moving beyond basic terms to articulate nuanced feelings.

Analytical Application & Cognitive Awareness

Analyze personal experiences by deconstructing the relationships between situational triggers, automatic thoughts, and resulting emotions.

Apply cognitive restructuring techniques to challenge automatic negative thoughts and develop balanced perspectives.

Strategic Integration & Behavioral Change

Design and conduct simple behavioral experiments to test the validity of their beliefs.

Synthesize insights from their journaling history to develop a personalized toolkit of adaptive coping strategies

Habit Formation & Human Dimension

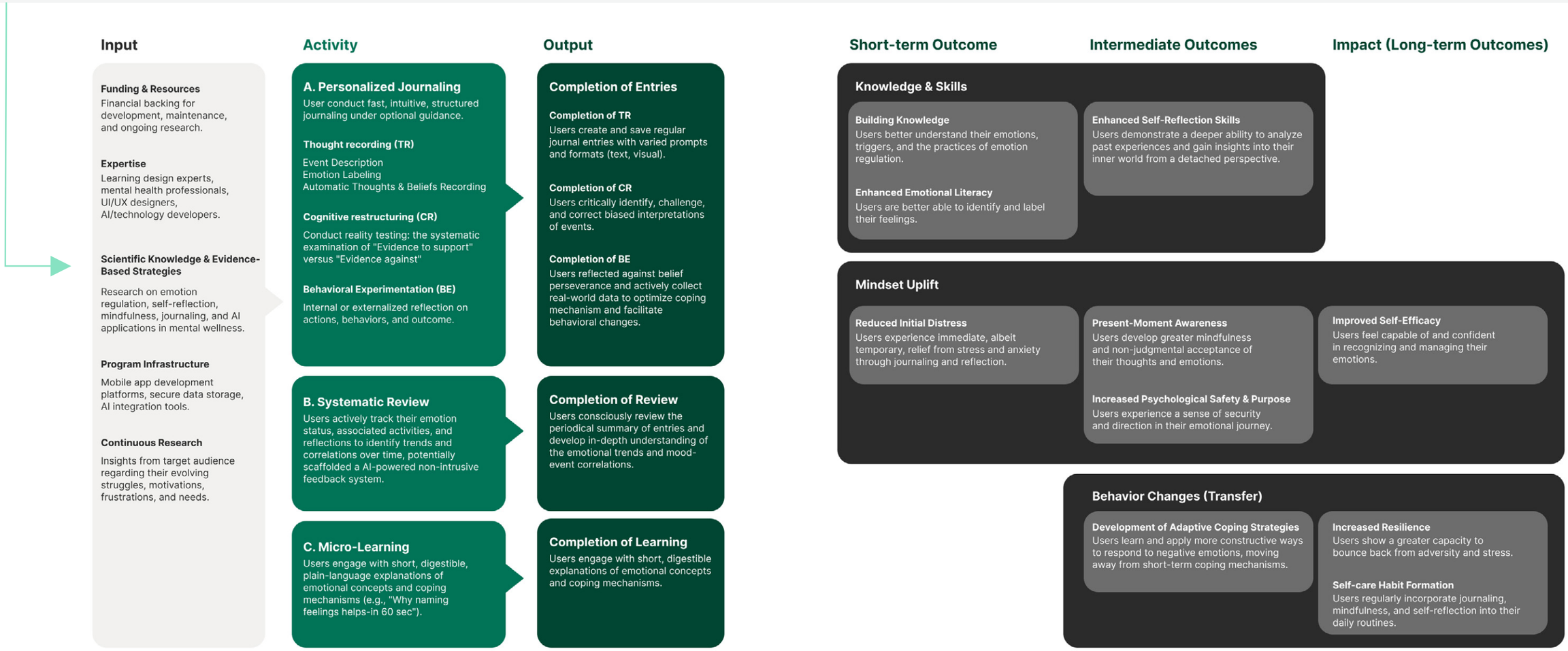
Integrate the practices of self-reflection, cognitive reappraisal, and self-care into a consistent daily routine, demonstrating a commitment to long-term emotional health.

4.2 Logic Model

This logic model serves as a comprehensive roadmap, articulating the underlying theory of how the proposed learning program is designed to function. It visually represents the causal relationships between program investments, activities, and intended results, providing a structured framework for planning, implementation, and evaluation. The model begins with Inputs, which constitute the essential resources and foundational elements required for the program's operation. These include financial backing and human expertise, a foundation of scientific knowledge on mental wellness, a robust technological infrastructure, and a commitment to continuous research to ensure the program remains responsive to user needs.

These inputs directly enable the core Activities, which are the specific interventions that participants undertake. These are structured into three interconnected components: (A) Personalized Journaling, which utilizes structured protocols for thought recording (TR), cognitive restructuring (CR), and behavioral experimentation (BE); (B) Systematic Review, allowing users to reflect on their progress over time; and (C) Micro-Learning, which delivers bite-sized explanations of emotional concepts. The direct, tangible products of these activities are the Outputs, such as the completion of journal entries where users successfully challenge cognitive distortions or engage with learning materials.

The model then outlines the sequence of intended effects, or Outcomes, which demonstrate the program's impact. In the short term, participants build knowledge and enhance their emotional literacy. These initial gains lead to Intermediate Outcomes, including improved self-reflection skills, a heightened awareness of the interaction between thoughts and emotions (Mindset Shift), and a growing sense of psychological safety. Ultimately, the program aims for sustainable Behavior Changes, where users transfer their learning to daily life by developing adaptive coping strategies, improving self-efficacy, building resilience, and forming consistent self-care habits.



4.3 Theory of Change

Our theory posits that by providing a structured, self-guided journaling framework (Activity A), users can systematically engage in cognitive reappraisal—an evidence-based emotion regulation strategy. This process of writing about an event, labeling the emotion, challenging automatic thoughts, and reframing perspectives directly targets and modifies maladaptive cognitive schemas.

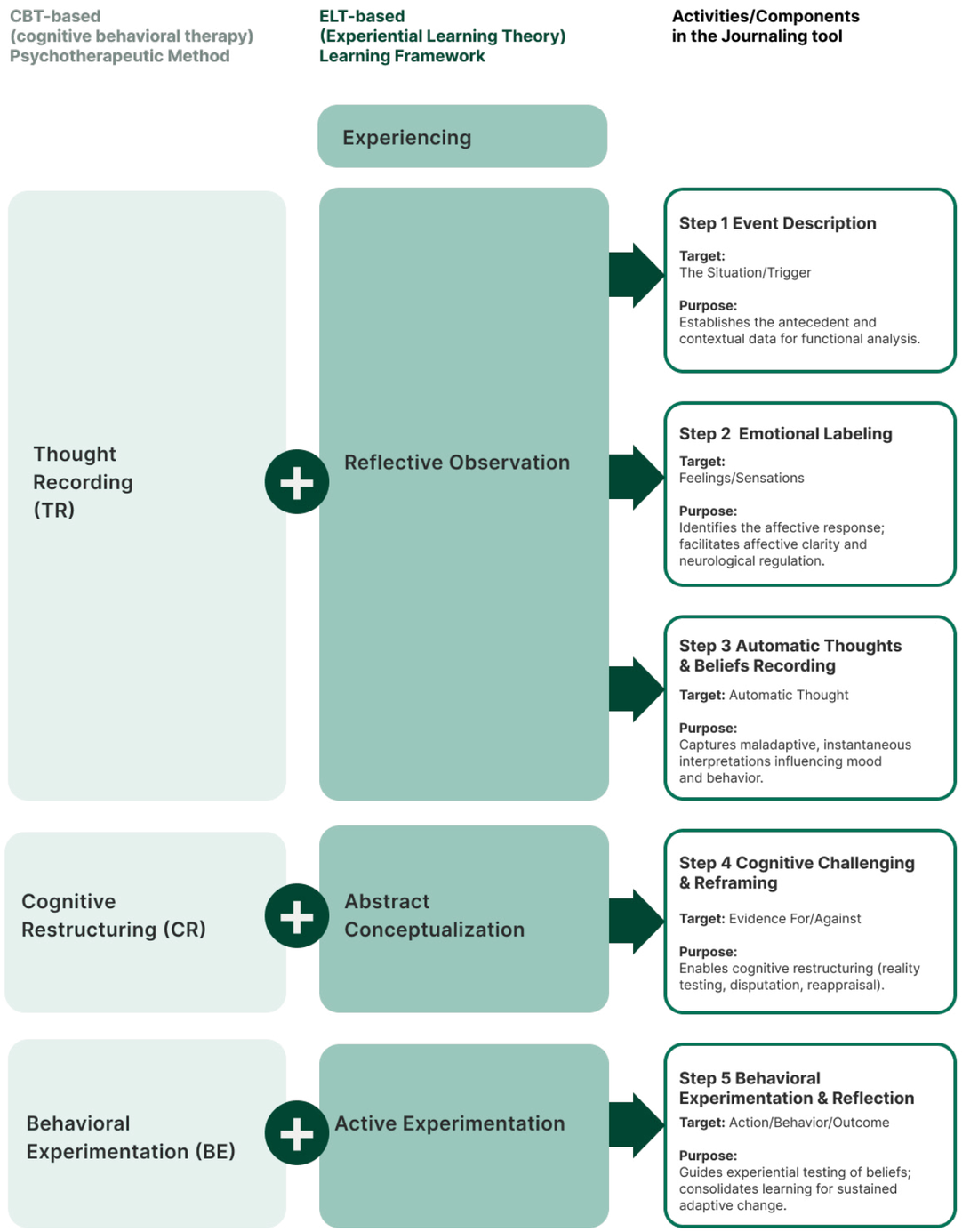
However, cognitive insight alone is often insufficient due to belief perseverance. Therefore, the Behavioral Experimentation (BE) component is critical. It translates cognitive restructuring into real-world, experiential learning, allowing users to collect disconfirming evidence against their old beliefs, leading to more profound and lasting change.

This core activity is supported by Systematic Review (B) and Micro-Learning (C), which reinforce learning and promote pattern recognition. AI scaffolding (detailed in 4.5) ensures this process is accessible and personalized, reducing cognitive load and providing timely guidance. We hypothesize that if users consistently engage in this supported, cyclical process, they will develop the knowledge, skills, and self-efficacy required to achieve the long-term outcomes of improved emotional well-being and resilient habit formation.

4.4 Journaling Activity Design

4.4.1 Self-Guided Journaling Framework

The core of the tool is to provide a self-guided journaling activity, designed to make the process of emotion regulation intuitive, structured, and effective. This activity is fueled by a unique framework that integrates the clinical rigor of Cognitive-Behavioral Therapy (CBT) with the cyclical learning process of Experiential Learning Theory (ELT). This framework ensures that each journaling session is not merely a cathartic release but a complete learning cycle, transforming a specific emotional event into a concrete skill and a plan for future action.

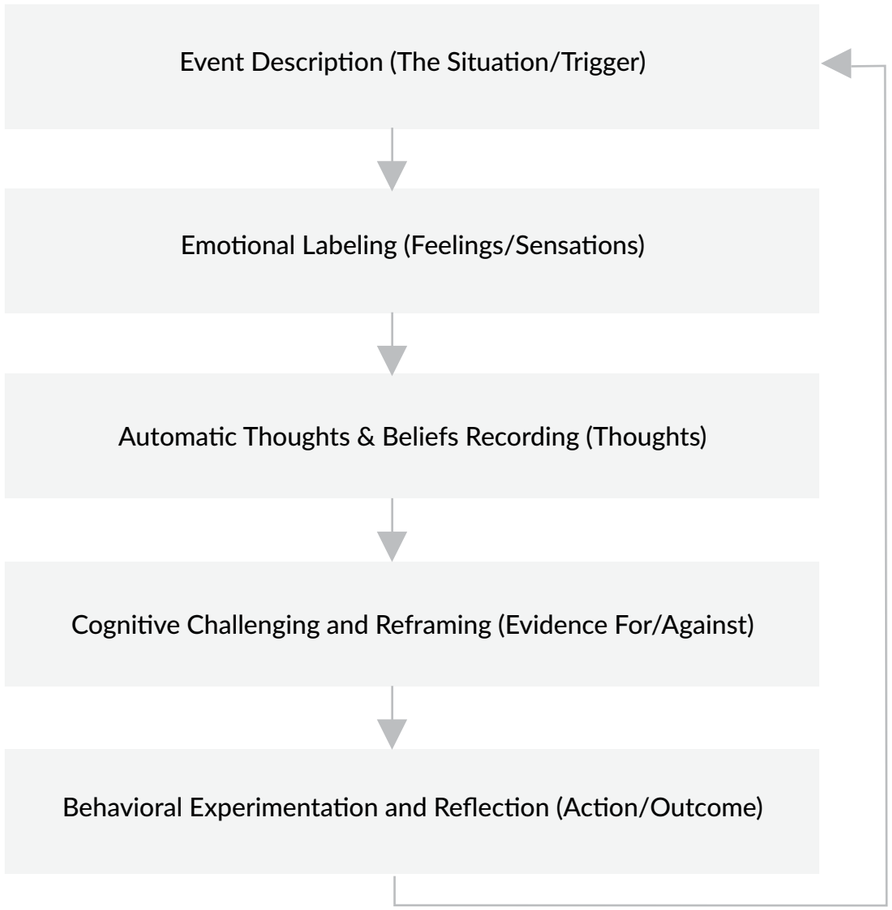


4.4.2 ELT Learning Theory as Foundation

Experiential Learning Theory (ELT) posits that effective learning arises from a cyclical process encompassing concrete experiences, reflective observation, abstract conceptualization, and active experimentation (Kolb, 2014). Learners gain insights through actively engaging with activities, reflecting on outcomes, and iteratively refining strategies.

My solution aims to mirror Kolb's cycle: users log emotional events (experience), use guided prompts for reflection (reflect), access educational content to synthesize lessons (think), and then experiment with emotional responses in real situations (act). This cyclical approach transforms emotional awareness into actionable growth by scaffolding each step, thereby making emotional learning explicit, structured, and progressive.

4.4.3 Flow of Activities



Event Description (The Situation/Trigger)

The first step in the structured protocol mandates a clear description of the situation or antecedent that provoked the emotional response. This is listed simply as "The situation – what happened?" in standardized records.

The clinical purpose of this step is functional analysis. By recording the contextual data, the individual establishes the precise circumstances and triggers leading to the distress. This systematic tracking allows the user to recognize recurrent patterns and external factors influencing their mood, which is a necessary precursor to effective intervention.

Emotional Labeling (Feelings/Sensations)

Following the description of the event, the individual must identify and quantify their affective response, often including corresponding physical sensations (e.g., "Frustrated, stupid").

This process of emotional labeling is critical for regulating emotion. Neuroscientific research highlights that the interaction between cognitive and emotional processes is fundamental to generating adaptive responses (Schmeichel, 2011). Journaling serves as a pathway for this regulation: neuroimaging research from UCLA indicates that expressive writing activates the prefrontal cortex (PFC)—the brain's executive control center—while concurrently dampening activity in the amygdala, the brain structure responsible for threat detection (Sohal et al., 2022). This neurological shift, facilitated by the conscious articulation of emotion, forms the basis for the anxiety-reducing effects of journaling and allows for cognitive processing to proceed.

The Mood Meter (Brackett et al., 2019), one of the four tools used by RULER, the evidence-based approach to social and emotional learning developed at the Yale Center for Emotional Intelligence, categorizes feelings along two axes—energy (high/low) and pleasantness (pleasant/unpleasant). This tool supports the development of a nuanced emotion vocabulary and increased emotional granularity ("emotional literacy"), which has been linked to better ER outcomes (Freedman, J., et al., 2024). In the context of this project, this tool should aim to directly address the research finding that users struggle with "accurately identify and label their feelings."

Automatic Thoughts & Beliefs Recording (Thoughts)

This stage involves capturing the unhelpful, instantaneous, or "on the fringe of awareness" thoughts associated with the described event and labeled emotion (McManus et al., 2012; Beck, 2011). These automatic thoughts are often exaggerated, distorted, or unrealistic and are known to play a significant role in psychopathology, e.g., "I never get anything right" or "I'm useless".

This stage is the core intervention of the written protocol. It involves cognitive restructuring (CR), which is the collection of techniques aimed at helping clients identify, challenge, and correct biased interpretations of events (McManus et al., 2012; Beck, 2011). In the written format, this is achieved through reality testing: the systematic examination of "Evidence to support" versus "Evidence against" the unhelpful thought. This employs Socratic questioning (e.g., "What is the evidence for and against it?" and "Are there other explanations?") in a self-guided format to foster balanced, realistic thoughts (McManus et al., 2012)

Cognitive Challenging and Reframing (Evidence For/Against)

It involves cognitive restructuring (CR), which is the collection of techniques aimed at helping clients identify, challenge, and correct biased interpretations of events (McManus et al., 2012; Beck, 2011). In the written format, this is achieved through reality testing: the systematic examination of "Evidence to support" versus "Evidence against" the unhelpful thought. This employs Socratic questioning (e.g., "What is the evidence for and against it?" and "Are there other explanations?") in a self-guided format to foster balanced, realistic thoughts (McManus et al., 2012).

CR is functionally achieved through cognitive reappraisal, an antecedent-focused strategy of emotion regulation (Gross, 1998b; Sheppes & Gross, 2011). Reappraisal involves reinterpreting the meaning of stimuli to intentionally modify the emotional response. Studies focusing on emotion regulation strategies confirm the potency of reappraisal in modifying subjective experience. Written reappraisal, when compared to acceptance strategies, is associated with larger decreases in negative emotions and larger increases in positive emotions in the short term (Sheppes & Gross, 2011; Gross, 1998b). This suggests that the systematic act of writing out the challenge and developing an adaptive response fundamentally modifies the cognitive schema tied to emotional distress.

Behavioral Experimentation and Reflection (Action/Outcome)

Behavioral Experimentation (BE), is essential because it translates those cognitive modifications into real-world, experiential learning, which is required for lasting change. Individuals often exhibit belief perseverance, the tendency to cling to a belief despite conflicting evidence. The BE directly counters this by forcing active engagement and collecting real-world, disconfirming data.

At this stage, reflection is the necessary final stage of the BE protocol, ensuring the new evidence is integrated into the individual's core schema. Reflection is a form of mental processing applied to complex or unstructured experiences, focusing on critical analysis of knowledge and experience to achieve deeper meaning and understanding.

4.5 Application of AI

After careful examination, the application of AI in my project primarily serves to scaffold the completion of the core activity in a moderate, controlled manner. It should not be the main interaction point for learners to receive guidance, but should provide support when a barrier occurs at certain stages.

This moderate application ensures AI reduces cognitive load, personalizes the experience, and provides timely scaffolds, while always keeping the user in the driver's seat of their emotional learning journey.

In Journaling (Activity A)

At TR Stage: AI performs sentiment analysis on event descriptions to help users identify and label nuanced emotions (e.g., suggesting "frustrated" or "disappointed" instead of just "bad").

At CR Stage: If a user is stuck, AI can generate open-ended, Socratic questions (e.g., "Is there another way to view this situation?") to prompt cognitive restructuring without providing direct answers.

In Systematic Review (Activity B)

AI identifies patterns in mood and journal entries over time (e.g., "Your anxiety tends to spike before deadlines") and presents these insights through simple data visualizations, empowering users with self-knowledge.

In Micro-Learning (Activity C)

Based on the themes of a user's journal entries (e.g., recurring topics of "social stress"), AI proactively recommends relevant micro-lessons from the library (e.g., "Setting Social Boundaries").

4.6 Learning Experience Design

Cognitive Theory of Learning (Cognitivism)

Theory Overview

Cognitive learning theory emphasizes mental processes—attention, encoding, storage, and retrieval—underlying learning and adaptation (Martinez, 2010). Effective tools reduce cognitive burdens and structure input for maximal user comprehension.

Application to Project

App features harness this principle via micro-learning prompts, chunked feedback, and interactive guidance that enhance recall and understanding. Through concise journaling entries, modular psychoeducation, and just-in-time feedback, the app supports users in easily processing and retaining emotional skills.

Cognitive Load Theory

Theory Overview

Cognitive Load Theory (CLT) focuses on managing the amount of information and mental effort required by users during the learning process. It distinguishes between intrinsic load (the effort related to the complexity of the material), extraneous load (unnecessary effort imposed by the way information is presented), and germane load (effort contributing to learning) (Sweller, 2011).

Application to Project

CLT informs prompt and feedback design: information is presented in clear, concise forms, avoiding unnecessary complexity or distraction, which is particularly important in emotionally sensitive contexts where users' cognitive resources may be limited. Journaling prompts, reflection activities, and psychoeducational content should therefore be broken into manageable steps, and interface clutter be minimized to allow users to focus fully on emotional processing (Sweller, 2011).

Self-Regulation Theory

Theory Overview

Self-regulation theory focuses on individuals' ability to monitor, evaluate, and modify their own emotional and behavioral states (Ryan & Deci, 2000). The self-regulation cycle involves goal-setting, self-monitoring, feedback, and behavior adjustment.

Application to Project

Mood tracking, goal-setting, and reflective feedback loops empower users to witness progress, refine emotional strategies, and enhance self-efficacy. Repeated cycles of intention-setting, monitoring, and outcome evaluation help cement emotional literacy and strength.

Inductive Reasoning

Theory Overview

The app supports inductive reasoning as a key learning strategy to guide users through the process of:

- Logging specific emotional events (e.g., "Anxiety about travel plans"),
- Identifying recurring patterns (e.g., "Stress peaks before deadlines"), and
- Generalizing effective emotion regulation strategies from these observations (e.g., "Mindful breathing reduces acute anxiety").

Application to Project

Inductive reasoning enables users to derive general principles and underlying emotional structures from their individual experiences with limited data, fostering deeper understanding and transferable skills (Martinez, 2010). This approach aligns with empirically supported cognitive strategies that enhance self-regulated learning and emotional literacy.

Mayer's Multimedia Learning Theory

Theory Overview

In the course of designing the experience, Mayer's Multimedia Learning Theory (Mayer, 2020) provides principles for effective information delivery using a combination of verbal and visual elements. Key principles implemented include:

- Coherence Principle: Remove extraneous words, images, or sounds that do not support learning .
- Segmenting Principle: Break content into digestible, bite-sized chunks, allowing users to process information step-by-step.
- Personalization Principle: Employ conversational language and address users directly, creating a friendly and engaging tone that enhances motivation and comprehension.

Application to Project

App features are designed for clarity and relevance by avoiding irrelevant information or distractions, following the coherence principle. Activities and feedback are segmented into sequential, manageable activities, reducing user overwhelm. Language in app prompts and psychoeducation is personalized, conversational, and warm, fostering emotional safety and engagement (Mayer, 2020).

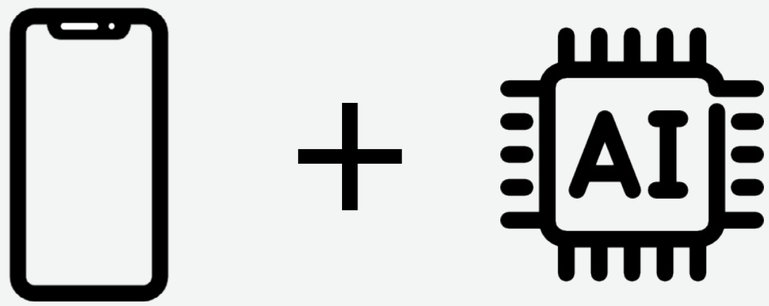
4.7 Media/Technology Choices

Mobile Application

A mobile app was chosen for its ubiquity, accessibility, and private nature. Students and professionals usually have consistent access to smartphones, making it a convenient platform for daily check-ins and on-the-go support. The personal nature of a smartphone also fosters the psychological safety needed for honest self-expression.

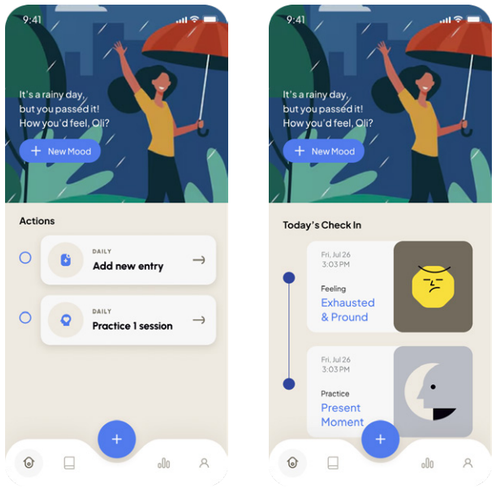
AI-Powered Analysis

As empirical research suggests, Artificial intelligence offers the potential to provide personalized, scalable support. It will be used to analyze journal entries and mood data to provide personalized insights and recommendations. This allows the app to act as a non-intrusive "emotional mentor," identifying patterns (e.g., anxiety spikes correlating with specific events) and suggesting relevant content or exercises without being overly directive.



5. Design Implementation

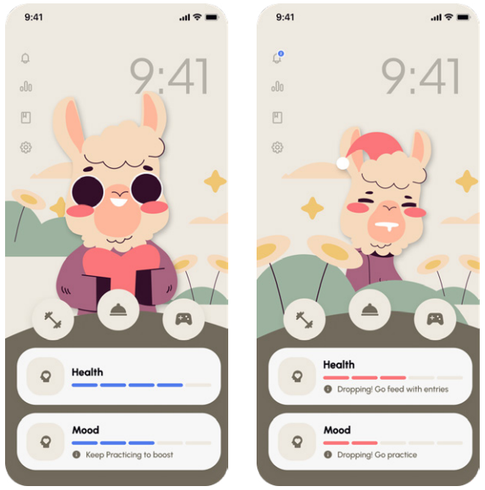
5.1 Initial Ideas (Concepts)



Concept 1: MyJournal

Direction: Linear activity-based journal

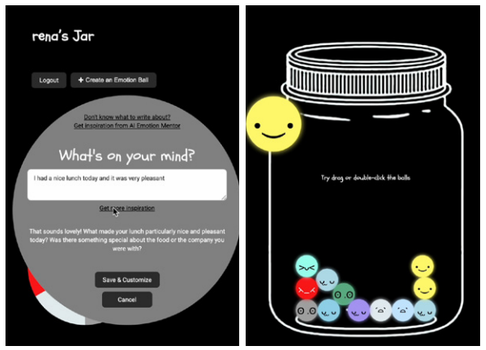
This concept focuses on a streamlined linear experience of guided journaling. It highlights activity completion as the core and is designed in a simplified style.



Concept 2: Tamagochi Simulation

Direction: Gamified simulation journal

This concept aims to provide an engaging gamified journaling experience of growing aside a spiritual vibe pal, fueling it with journal input from personal lives and gain insights in the meantime.



Concept 3: Emotion Jar

Direction: AI-powered interactive journal

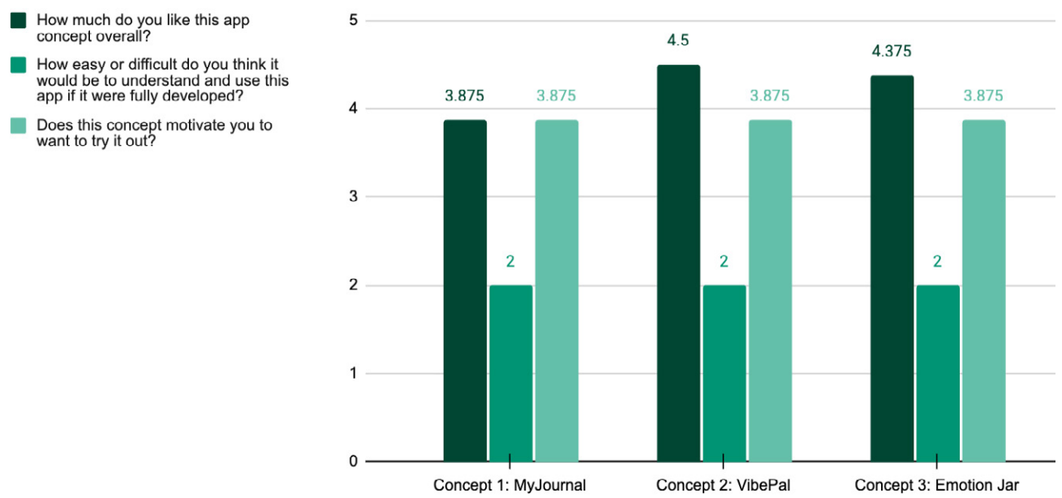
This concept is strong for its interactive experiences of filling the emotion jar. It enables users to externalize emotions in textual format and build upon them using AI-powered followup prompts.

5.2 Concept Testing

Testing Process

Participants are surveyed to provide 5 sessions of feedback on each concept:

- Session 1: Participants are tasked with generic questions on familiarity with journaling and emotion regulation
- Session 2-4: In each session, participants are provided with a link to the prototype to play around with followed by six questions: 3 quantitative questions to measure the viability, motivation and overall preference towards the concept; three qualitative questions upon the first impressions, highlights, and sources of appeal/confusion.
- Session 5: Participants are asked to compare the three concepts and provide specific expectations upon additional features to be potentially incorporated into the presented concepts.



Overall Results | Quantitative

Though the three concepts share very different visual and interaction styles, participants found them to be equally easy-to-understand and motivating (See Chart above). This result echos with the overall familiarity of learners with journaling practices (7 out of 8 participants have journaled before), which suggests prior knowledge is the main factor for learners to jump-start.

On the Motivation Pillar | Qualitative

Additionally, on the motivation pillar, the incorporation of interactive features (e.g., the flowing ball in concept 3 and cute pedagogies in concept 2) are highly preferred due to their engaging nature. The concerns at this point is whether they might distract learners from the core activity and decrease intrinsic motivation, which could hinder learners' performance in the long run due to the overjustification effect (where learners are heavily reliant on external rewards and practice with the bare minimum effort to win rewards until the reward loses its power through time).

On Personalization | Quantitative

However, there are also major concerns. For the level of flexibility, 6 out of 8 participants noted they would like to see multimedia input format and interface customization, which suggest the concept user flow could be too streamlined for those who expect higher levels of personalization.

On Features | Quantitative

Meanwhile there are also conflicting voices over the level of complexity. Some participants believe the comprehensiveness of features and flows introduced might not be necessary, indicating a potential for the hierarchy and focus of the App to be further optimized. For instance, several participants with strong emotion regulation and journaling background commented that certain guiding steps are not necessary, indicating the redundancy of introductory content for experienced learners. Others expressed their expectation to see more complex, in-depth insights from the entry analysis. Some participants, for example, called out that it's hard to track emotion on certain dates in Concept 3, suggesting learners' initiative to revisit entries and the necessity to keep a holistic entry library for archiving and reflection.

5.3 Usability Testing (Low-fidelity)

Iteration

With insights infused by the concept testing, the low-fi prototype focuses on the core activity of TR and BE, with interaction/guidance varied upon the expertise of learners. Additional features that might interfere with a learner's activity performance (e.g., the pedagogy and reward system) are significantly reduced. In addition, it offers 2 ideas of visually displaying the past entries to help learners rewind their thoughts.

Testing Process

Participants were first briefed on the project context and assigned one of three distinct user roles, which they maintained throughout the session, using colored stickers to denote their adopted persona for each piece of feedback. For the interaction, participants were shown static prototype screenshots (wireframes) and asked to provide feedback directly on the shared workspace. This involved using pre-defined stamps (icons) to quickly classify elements (e.g., "Necessary," "Confusing," "Engaging") and writing detailed comments focused on the proposed flow, features, and instructional text (text-copy). This structured approach ensured the collection of targeted, qualitative feedback from multiple user perspectives, providing valuable data for early-stage conceptual and design refinement.

Findings and Indications

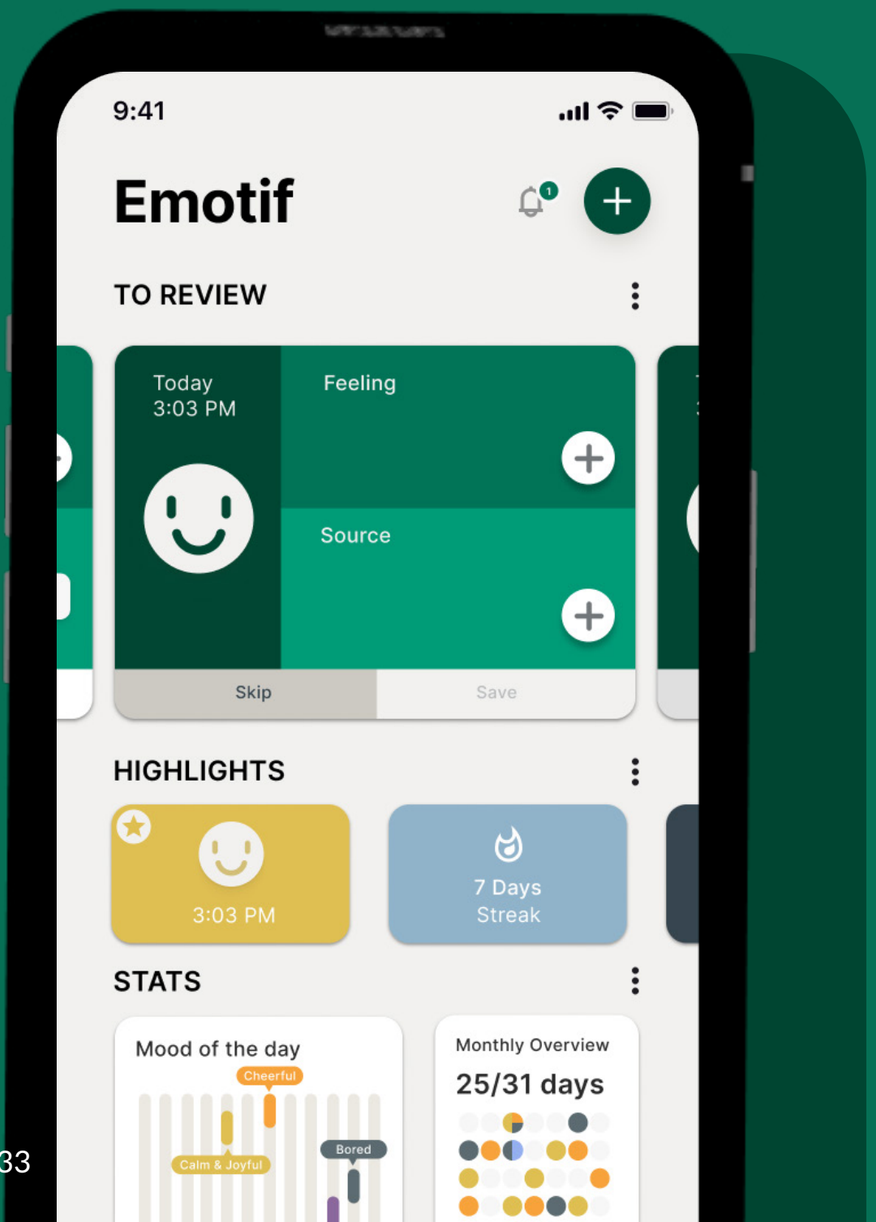
Overall, participants reacted positively to the simplified user flow and found most scaffolds adequate, especially the optional AI incorporation for prompting and analysis. Meanwhile, further investigations are recommended for legal protocols, seamless integration with mobile functionalities, data visualization, and the tone of voice.

Regarding the visual display, the creative representation of emotions is highly preferred, but there are also concerns over whether the visual theme could be further refined. For example, for the AI entry-to-illustration idea, many participants suggest the feature to be overly simplified and lack room for customization. It might add complexity to data entry without bringing additional value or benefits to the journaling practice itself.

5.4 Final Design (High-fidelity)

5.4.1 Summary

The final solution, Emotif, is an on-the-go emotion regulation mobile app designed specifically for young students and professionals to cultivate emotional self-awareness, resilience, and adaptive coping skills. The app integrates evidence-based cognitive and psychological techniques, empowering users to record and identify nuanced emotions, recognize behavioral and cognitive patterns, facilitate adaptive changes, and build long-lasting emotional self-care routines.



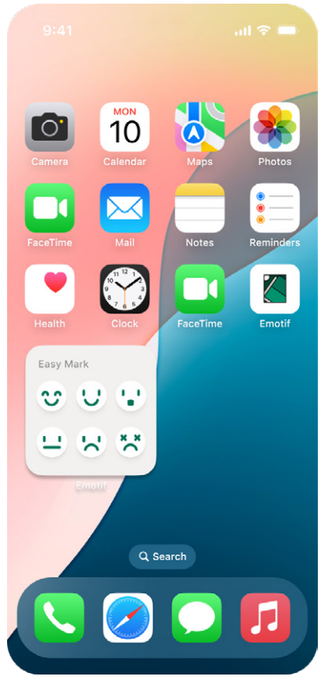
5.4.2 User Journey & Key features

Phase 0: Capture

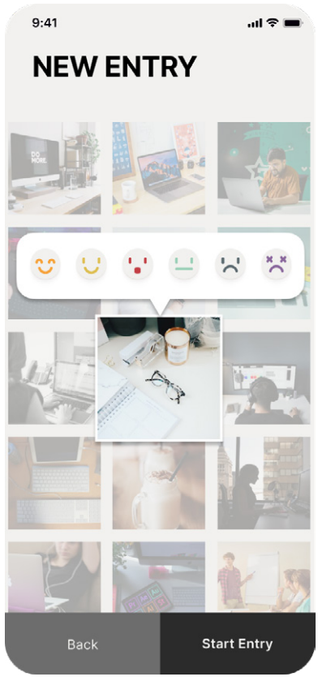
Speed Journaling

Users begin by simply labeling their emotion using an emoji. This leaves an immediate “trace” on the scene—quick, easy, and capable of capturing nuance in seconds. To accommodate different contexts, users can initiate this trace in three ways:

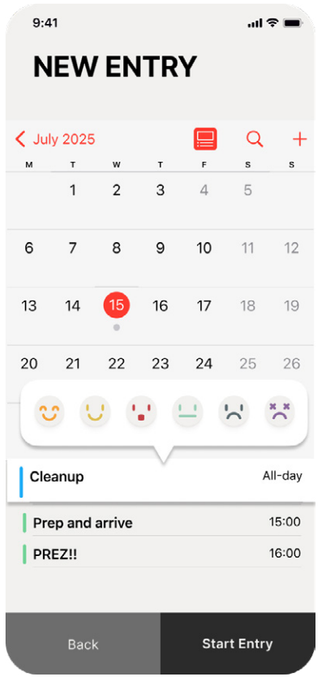
The Widget:
Tapping an emoji directly from the home screen.



The Album:
Selecting a photo and label with an emoji.



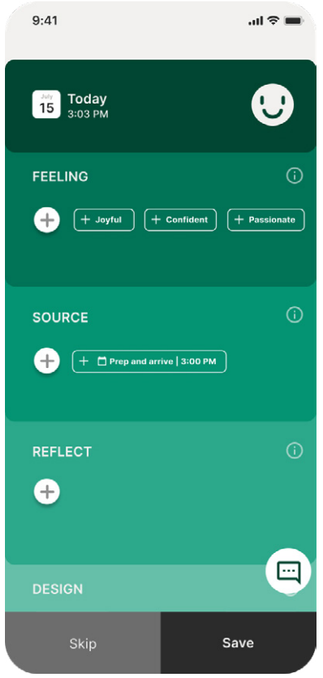
The Calendar:
Selecting a specific event and mark an emoji to the time block.



Phase 1: Process

Speed Journaling

Once the anchor is set, the user enters the elaboration phase. This flow creates a comprehensive snapshot of the user's internal state.



Optional A: Manual Input

The Feeling Session

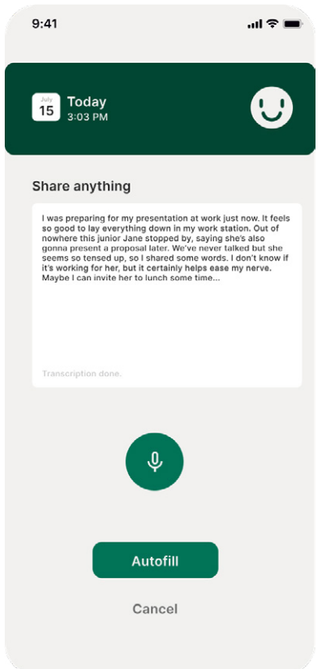
Users elaborate on the feeling with more precise vocabulary to build emotional literacy by moving beyond "good" or "bad."

The Source Session

Users then identify the "why" behind the feeling—notes on the environment, people, or activities. It establishes an initial thought of connection between feelings and sources.

The Reflect Session

Users engage in Cognitive Restructuring to record and challenge their initial thoughts.



Optional B: Autofill

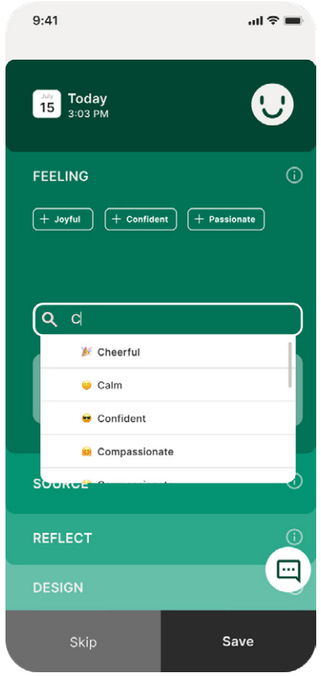
For users who prefer to speak their mind, the entry can be bypassed via Auto-fill. Users simply narrate their experience via audio or text. Pre-trained Local LLMs process the transcription and populate the fields automatically—ensuring 100% privacy with no personal data sent to the cloud.

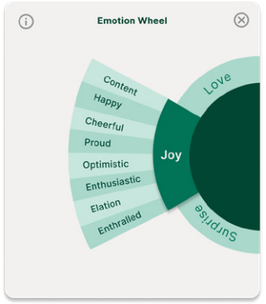
If a user struggles to name their feeling, Emotif provides a scaffolded library:

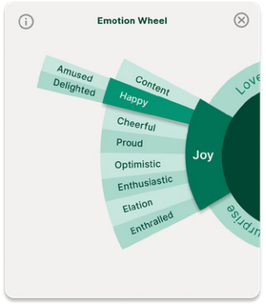
Search Bar:
Access a quick list of common emotional terms.

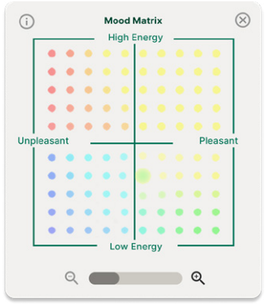
Emotion Wheel:
Drill down from general categories to specific nuances.

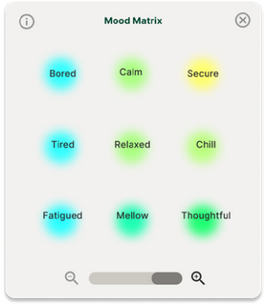
Mood Matrix:
Locate the mood based on energy and pleasantness dimensions.

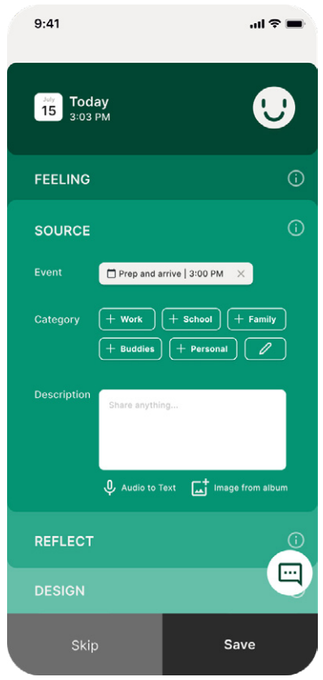






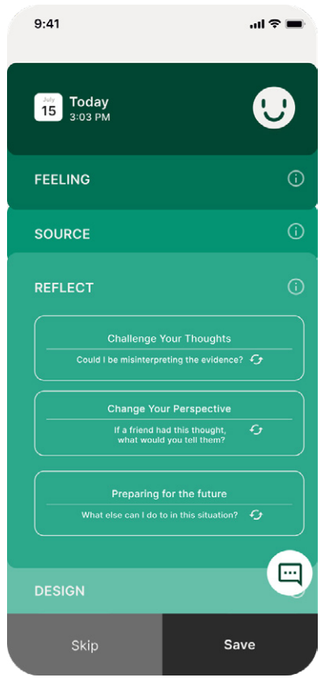






Emotif automatically syncs with the user's Calendar to suggest context.

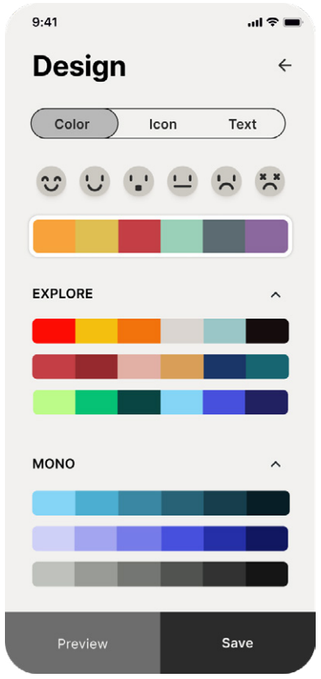
Rather than an empty text box, the app offers thought-provoking prompts to challenge negative thoughts, transforming a heavy journaling session into a focused, 3-minute interaction.

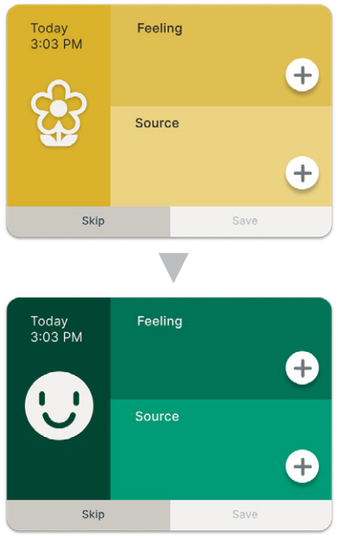


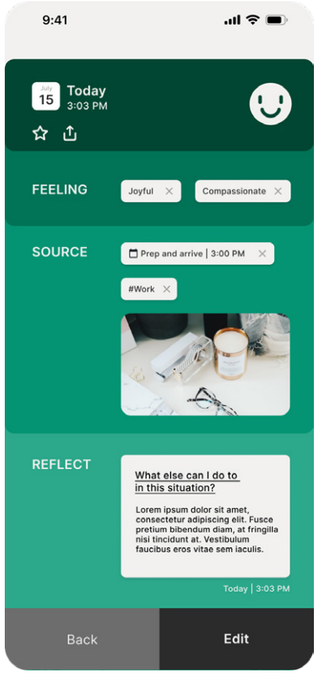
Phase 2: Personalize

Speed Journaling

Because emotional processing is deeply personal, the visual of entry reflects the user's vibe. Emotif is fully customizable, allowing users to retouch their entries with personalized color themes and icon sets, ensuring the app feels like a safe, personal sanctuary.







At this point, users successfully created a personal entry, which they can later edit and refine based on their needs.

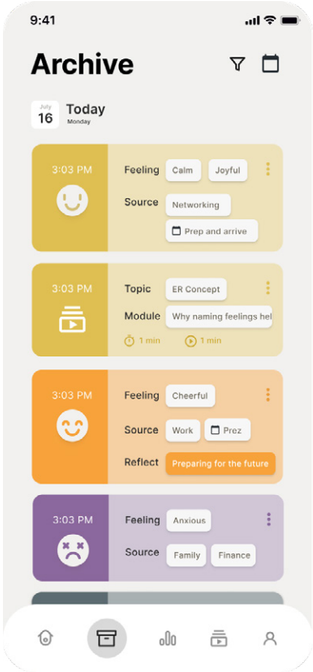
Phase 3: Insight

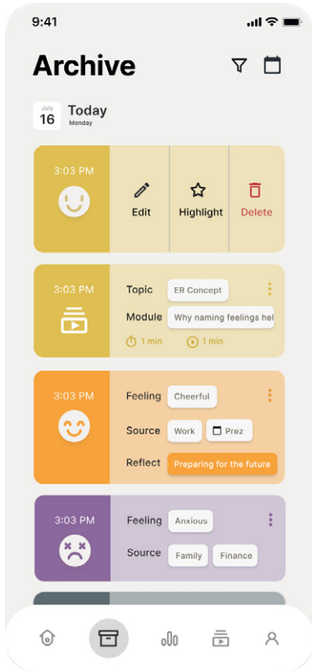
Smart Review

Once the entry is complete, it enters the Archive. Emotif transforms this data into visual diagrams and actionable insight which users can access through the Stats.

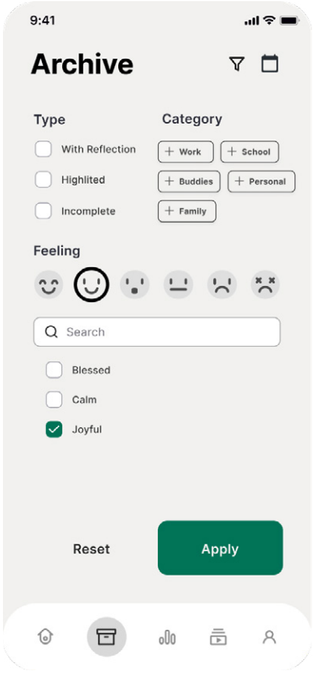
Optional A: Active Filtering

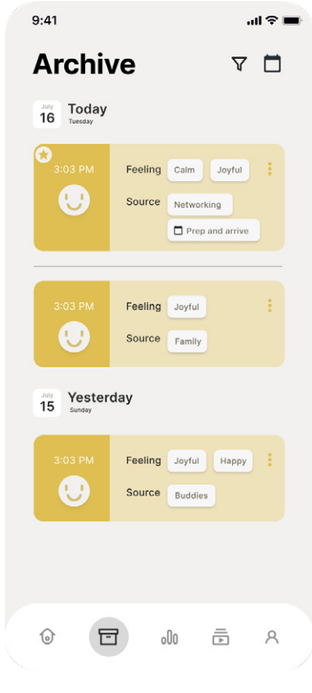
Users can edit, highlight, and pin top entries.





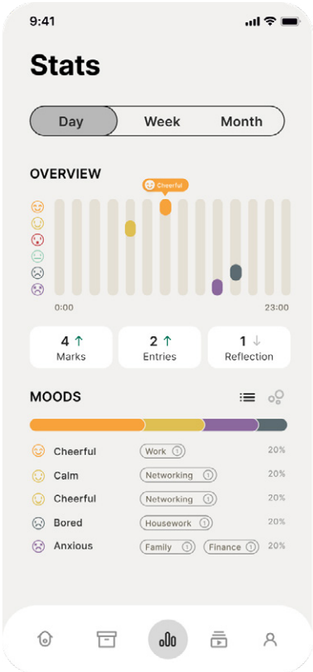
Powerful filters allow for Inductive Analysis, letting users sort by emotion label, category, or time to see their own history clearly.

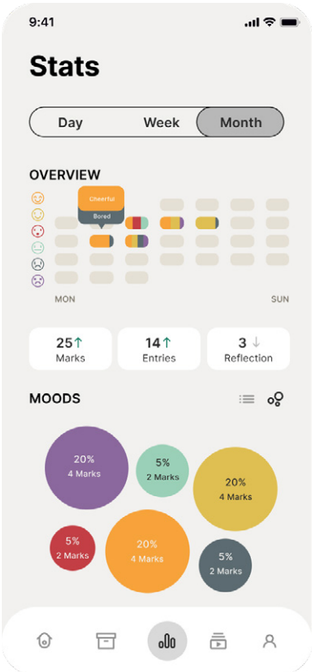




Optional B:
Scaffolded Visualization

For a broader view, Emotif visualizes data across days, weeks, and months with diagrams that best showcase the trends.





For further analysis, users can click through the category tags. Non-intrusive, text-based analysis highlights patterns the user might miss.

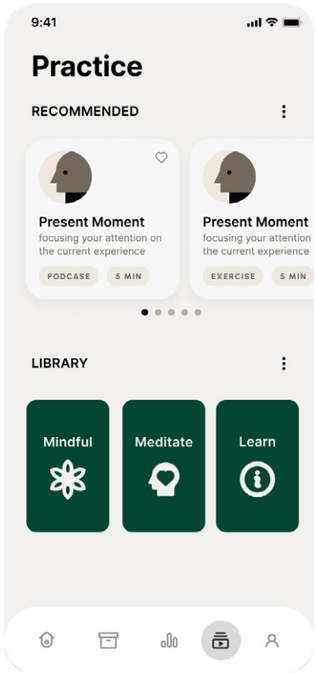
This integrates new evidence into the user's core schema, helping them bundle connections and achieve a deeper understanding of complex experiences.

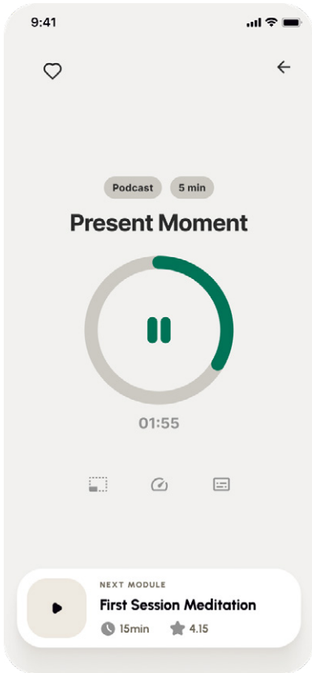
Phase 4: Growth

Micro-Learning

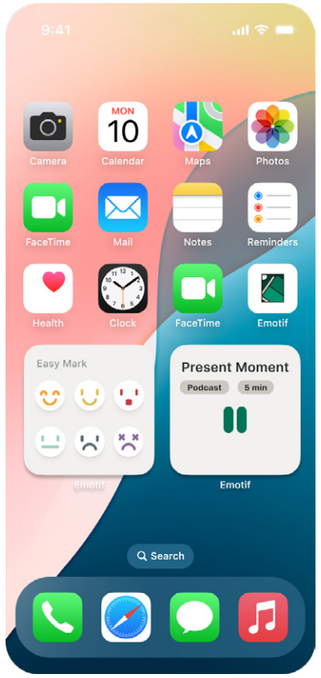
To support the user outside of active journaling with self-initiated technical practices, Emotif offers Micro-learning. Users access the sessions from the Practice and select their preferred ways of learning.

The Practice:
Users can access self-guided practices and fundamentals of emotion regulation.





The Widgets:
Educational content is accessible directly from the home screen.



6. Conclusion

6.1 Implications

The EMOTIF project, through its systematic design and development process, offers significant insights into the domains of emotion regulation and learning design. The rigorous application of a hybrid Double Diamond and ISD model, coupled with iterative user and expert testing, confirmed the critical need for structured, accessible tools that help young adults navigate the complexities of the modern "emotional recession" (Freedman et al., 2024). This project demonstrates that emotion regulation is not an innate trait but a learnable skill, and its acquisition can be effectively scaffolded through a carefully architected digital environment.

This journey provides a crucial insight for emotion regulation: the transition from unstructured emotional expression to structured cognitive reappraisal is paramount. While catharsis has its place, the project underscores that sustained well-being is better facilitated by interventions that guide users through cognitive restructuring and behavioral experimentation, as derived from Cognitive-Behavioral Writing Therapy (Pascoe, 2016) and the Interacting Cognitive Subsystems model (Teasdale & Barnard, 1993). The identified user barriers—lack of structure, risk of rumination, and cognitive load—highlight that effective digital tools must do more than just provide a platform for journaling; they must actively guide the process to prevent maladaptive patterns and promote adaptive change.

In terms of learning design, this project illustrates the power of synthesizing established educational theories into a cohesive digital experience. The core journaling framework, which integrates the clinical steps of CBT with the cyclical phases of Experiential Learning Theory (Kolb, 2014), serves as a model for designing transformative learning activities. It validates that complex psychological processes can be broken down into manageable, "chunked" steps (Sweller, 2011) that respect the user's cognitive load while leading them through a complete cycle of experience, reflection, conceptualization, and experimentation. Furthermore, the project demonstrates a principled approach to integrating AI, positioning it not as a crutch or a replacement for human cognition, but as a scaffold that provides personalized nudges and pattern recognition to enhance, rather than undermine, the user's self-regulatory capacity and intrinsic motivation (Ryan & Deci, 2000).

6.2 Limitations

The primary limitation lies in the scope of its user research and testing; while insightful, the participant pool was relatively small and geographically limited, primarily recruited from university and professional networks. This may not fully represent the diverse emotional experiences and technological literacies of the broader global population of young adults. Additionally, the proposed use of AI, while thoughtfully constrained, presents inherent limitations in its ability to accurately interpret nuanced human emotion and its potential, albeit mitigated, to engender over-reliance.

6.3 Future Direction

The immediate next step of this project is to progress from the high-fidelity prototype to a fully functional minimum viable product (MVP). This will enable a longitudinal field study to empirically test the hypotheses laid out in the logic model. Such a study would measure the app's efficacy in improving emotional granularity, reducing symptoms of anxiety and depression, and fostering the long-term habit formation that is the ultimate goal of the learning experience.

Future research should build upon the foundations laid by this project. First, the longitudinal study mentioned above is critical to move from measuring user engagement to validating learning outcomes and behavioral change. Second, future studies should specifically investigate the differential efficacy of the AI components—for instance, A/B testing the impact of AI-generated Socratic questions versus a static list of prompts on the depth of cognitive restructuring. Finally, the insights from this project should be explored in more diverse cultural and demographic contexts to ensure the framework's adaptability and inclusivity, and to examine how socio-cultural factors influence the practice and scaffolding of emotion regulation.

In summary, the EMOTIF project contributes a theoretically grounded and user-validated framework for digital emotion regulation. It underscores the vital intersection of learning science, clinical psychology, and human-computer interaction in creating tools that do not just track mental states, but actively educate and empower individuals to build a more resilient emotional future.

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