

Development of a Mobile Application through Interface Design: Mental Health Assessment and Support for College Students

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Abstract: The mental health of college students has received a lot of attention from designers in recent years. The development of applications to help college students support their mental health has a considerable market prospect. At the same time, there is some room for improvement in the interface design of related applications. This article mainly discusses the theoretical framework and interface design direction of providing meditation and emotion tracking as two kinds of mental health applications. Through literature review, it proves the effectiveness of developing apps through interface design to positively affect mental health disorders. The results of the study show that college students have a strong need for personalized interface design for apps, a lack of motivation and spontaneity in the continued use of the apps, a lack of information on how to use mental health apps appropriately, and a lack of psychological knowledge on the part of the users. This research provides a reference direction for prototyping mental health apps to make up for the lack of existing interface design.

Keywords: Mobile application; Interface design; Mental health; College students

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1. Introduction

Nowadays, with the rapid updating and replacement of mobile phone development technology, people spend a lot of time every day using mobile phone programs that can achieve a variety of functions. The number of people who are dependent on their mobile phones is also growing, and some of them have even become addicted to them. The highest level of addiction is found among degree students, as this group has plenty of time at their disposal during

their college years, without heavy social responsibilities and family burdens ^[1]. College students irrationally allocate time for mobile phone use, leading to mobile phone addiction, which negatively affects their mood and mental health ^[2]. At the same time, university students face challenges to their mental health as they adapt to their new campus environment and try to make new friends. Studies have shown that a quarter of students have felt depressed. The emergence of negative emotions among university students is also importantly linked to interpersonal relationships. When students feel disconnected from each other or isolated, it can also increase the risk of mental illness among university students ^[3].

The concept of humanistic care in design has prompted a lot of designers to focus on the mental health issues that people have when designing apps. Using this as a starting point, the interface design provides people with a platform for psychological assessment and support. The main categories of design types of mental health apps common in the app market are meditation and positive thinking, mood tracking, peer support, professional support, and courses ^[4]. Positive thinking meditation, a treatment for depression, uses a gamified framework to guide users through a meditation session. When used by college students, it has been able to significantly reduce levels of depression. Compared to the possible adverse effects of medication, the meditation program has more advantages, from the lack of side effects to the price and convenience ^[5]. Mood tracking is designed to allow people to choose the color, emoticon, etc., that corresponds to their mood at the moment and personalize the text and images through the interactive design of the interface. The program is designed to be visualized and fed back to the user through the recorded data. People consciously attend to and manage negative emotions through the use of emotion tracking. However, when people use these methods to record emotions, they want to be able to personalize their emotion options because of the diversity of words used by each person to express different emotions ^[6]. Through the interface design, it grasps the user's stickiness to mobile phone use, widens the channels of propagating psychological knowledge, and enables students to detect the problem in time and get effective help at the early stage of mental health problems ^[7]. The overview illustrates existing mental health program interface design weaknesses and identifies innovative breakthroughs. It provides effective and authoritative design recommendations through experimental results and interface design trends, and feedback from mental health experts. The design of meditation and mood tracking applications is taken as the main subject of the review.

2. Literature review

Fish and Saul investigated the effectiveness of using a meditation app for alleviating depressive symptoms in college students ^[5]. To recruit college students inexperienced in using positive thinking meditation to alleviate depression, a randomized controlled trial was conducted using a guided meditation app. The experiment consisted of having participants engage in 10 sessions over two consecutive weeks, with the sessions providing guided meditations of up to ten minutes for testing. Incentives were also set up. The self-determination theory (SDT) and gamification structure were used to increase participant motivation, and the use of gamification principles made the process more fun. The test collected data using Headspace, where the interface was designed to include the ability for students to

self-select the content of the course, using different themes for the meditation experience, offering personalized options. On first use, animations were provided to guide the practice of the meditations. A large number of illustrations and dynamic effects were also used within the software to enhance user engagement.

Depressive symptoms were measured using the Patient Health Questionnaire (PHQ-9), which allowed users to score their own assessment after the meditation session and to understand the mood changes before and after the session through the scores. The results showed that five of the nine scores showed significant decreases compared to the pre-session scores. These included low mood, fatigue, poor spirituality, depression, and irritability. The results of the experiment demonstrate the effectiveness of the use of the Positive Thinking Meditation app in reducing depressive symptoms in college students. The disadvantages of meditation practice include the amount of time it takes to learn and practice to master it [8]. Using a meditation program only requires headphones to start, there are no restrictions on location, and the practice time is much shorter, with the program planning ahead for the user to use it wisely. Personalized support is provided to increase their autonomy in engaging with the use. The limitations of the experiment are reflected in the fact that the sample size was small—predominantly female—and the students participating in the experiment were all from the same school. Self-assessment may have data inaccuracies. It provided a theoretical source of data and a design case reference for providing psychological support to college students through interface design.

Analyzing the data, Cha and Lee [9] pointed out that the existing meditation app market is slowing down but is still popular with a large number of users [9]. Meditation app development continues to innovate, using technologies such as AR and VR to combine with meditation scenarios and develop different types of natural environment experiences. User experience and user interface design trends are proposed to increase user satisfaction and comfort in using apps. These include (1) Dark color mode, which refers to the ability to protect the eyes when users use the app at night. (2) For UI design, in the MAC OS system, the realistic ICON drawing style increases, enhancing the icon for the depth of observation of light and shadow and the structure of the object; it is more natural and realistic, enhancing the user's visual impact and interest. (3) In terms of color selection, rich and strong colors are used for creation, thus enhancing the user's visual experience of using the software. (4) The title font is redesigned to highlight key content. (5) More illustration designs are added in the software design content. (6) 3D style and narrative illustration are popular in the design style. The increased use of 3D animation scenes enables a more intuitive feeling of the product concept and a stronger sense of user participation and interaction, enhancing the user's visual experience. Compared with the above, further visual design suggestions are provided based on the current user aesthetic trends. At the same time, the preference for the use of illustration and dynamic effects is in line with the interface design style experimented above. However, the design lacks experimental data and needs to be evaluated for the use of interface design. Unlike Fish and Saul [5], who obtained their data sources from studying interface design theories and using the PHQ-9 questionnaire research, Cha and Lee obtained data on the visual design of meditative apps by analyzing existing style trends in the app market.

According to Caldeira *et al.*, studying the sentiment tracking functionality, the data came from 742 apps related to sentiment tracking in the Android shop and IOS app shop [6]. A total of 32 apps from both platforms were selected

and analyzed for their app functionality. A stage-based model of personal informatics systems is selected for analysis. The system contains five stages: preparation stage, collection stage, integration stage, reflection stage, and action stage. After analyzing the functionality of the selected application, it was concluded that in the preparation phase, pre-information is placed to introduce the tracking function used by the program and to guide the user in tracking the emotions. In the collection phase, different ways of tracking and recording the emotions of the moment were used to set the frequency and time at which they wanted to collect emotional data. In the reflection phase, the data accumulated by the user is collected and analyzed visually. In the action phase, the data is used to give users mental health advice and provide professional psychological resources, as well as support the export and sharing of personal data. The analyses concluded that in the preparation phase, the apps generally lacked psychological support information, such as how to properly manage emotions when users use them for the first time. There was also a lack of guidance for novice users when introducing the features. In the collection phase, among the features were (1) the user's selection of emotional keywords through preset text; (2) entering text content freely, (3) choosing a color that matches the current mood, (4) choosing to express the emotion by taking their own photo or a picture from their phone; (5) recording audio, (6) picking emoticons, and (7) scoring their emotions. The emotion visualization in the reflection phase, on the other hand, has a reflective effect by displaying various visual designs such as bar charts or pie charts to let users understand their emotional state. Only seven of the selected applications analyzed provide suggestions for future actions.

Analyzing the app market, 24 mental health apps, Hamre-Os classified them into five categories by implementing different functions [4]. It also proposes which operational design factors to consider when programming a mood-tracking interface. During the development process, the prototype was designed in three iterations. At the same time, market user requirements, expert feedback, and user testing were investigated to improve the design prototype at each stage. The research data was obtained by conducting research on literature and based on user feedback analysis. At the early stage of design, requirements were made for the main functions: (1) The ability to have a wider range of choices when selecting pre-set emotions during emotion tracking. (2) Functionality to display the level of emotion in the moment. (3) Support for reflective review of previous tracking data. (4) Providing professional psychological support or counselling from a psychological agency. (5) Tracking reminders. The design requirements were consistent with the design flaws and user needs presented above, further demonstrating the problems with the design of the emotion tracking interface.

3. Discussion

There was a lack of strategic approaches for users to help alleviate their emotions [6]. The study concludes that more consideration should be given to the design of emotion tracking processes to enrich the design of the preparation and action phases in order to provide users with better psychological support. The existing design lacks user personalization options. The design protects the privacy of personal data and allows data to be shared with

professionals. The limitation is the lack of validation of the authenticity of the data. Mood tracking design, as part of the design to provide psychological support, was studied to analyze the structural design of the program while providing theoretical support for the system and suggesting changes to the interface design. In the three iterations of the design proposal, health psychology experts suggested that care should be taken when designing icon symbols and text words to avoid misunderstanding [4]. For the interface design, it was proposed that users should be able to easily preview a variety of different emotions in the mobile phone interface to facilitate the use of interaction. Attention was also paid to the fact that students have varied interpretations of different emoji designs and color choices when using the program. This can be customized to help students use the mood tracking tool better and get more accurate data. It is also necessary to provide a beginner's tutorial when using the software for the first time. The program should have the ability to see previous tracking data and the ability to customize different interface layouts, as well as setting the background to personal preference or making the style cleaner. Limitations are reflected in the data collection, which is all qualitative, and more research support is needed for further proof. With college students as the main users, we analyze the emotion tracking design factors, uncover personalized needs design gaps, and develop interface design prototypes. The difference with the previous literature review is that it is based on Caldeira's theory of design, and Hamre-Os further addressed the flaws in the preparation and action phases through design.

4. Conclusion

This literature review discussed two main design directions, meditation and mood tracking, by analyzing apps that provide mental health assessment and support. Existing experimental data and design cases are analyzed, and the results conclude that the development of mobile apps through interface design can help college students alleviate psychological problems. Meanwhile, according to the shortcomings and deficiencies of the existing interface design solutions, we optimize the interaction design for mental health, study the style trends of interface design, master the principles of structural design, and make theoretical preparations for developing design prototypes that college students like, theories include SDT and a stage-based model of personal informatics systems. Attention was paid to the need for personalized interface design to provide more professional psychological information and guidance for use in the process of psychological assessment and record-keeping for college students, including the use of more illustrations and animation effects and the use of gamification to enhance user motivation. This will help college students to develop a sense of mental health management so that they can have a healthier mindset to face the challenges in life. Future research can study how college students feel about using mental health software, conduct questionnaire surveys, explore the reasons for users' lack of motivation and abandonment of use, fill the design gap of how to cultivate users' spontaneous use, and optimize the design of mental health applications for the college student population.

Disclosure statement

The author declares no conflict of interest.

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