Usability issues of Headspace: A Qualitative Analysis of User Experience

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Abstract

Headspace is a guided meditation mobile app that is friendly to beginners. The experience of using this mobile meditation application is usually intimate and timely. In order to collect accurate user feedback data, this study used user diaries and extreme user interviews to conduct a thematic analysis of four users' perceptions of use during a seven-day trial period. Results showed four perceived value dimensions: perceived easiness of use, perceived hedonic value, perceived usefulness, and perceived price value. The four dimensions constructed were similar to those of TAM and UTAUT. Although users approved both perceived easiness of use and usefulness, further subscriptions were discouraged due to high perceived price value. Additionally, the study incorporates the Try-it-yourself approach to summarize the usage process and potential improvement issues, providing some valuable guidance for subsequent updates to Headspace.

1. Introduction

Mindfulness is often regarded as concentrating fully on what is happening, from how we feel physically to the changes in our environment [1]. In therapeutic practice, positive mindfulness has been found to promote physical and spiritual well-being [2]. In traditional Buddhist culture, mindfulness is widely practiced to train wisdom and develop a sense of morality and compassion [3]. In modern medical practice, as meditation has been found to promote physical and spiritual well-being [4], it is also seen as a health therapy.

Traditionally meditation is a practice that relies on physical guidance and is usually taught in the form of face-to-face classes. With the development of digital technology, mobile media is increasingly becoming a platform for delivering meditation concepts and practices [5]. A study by Wahbeh et al. reported that almost half of meditation participants prefer internet-based meditation training [6]. This ancient practice has come into people's lives in a way that is easier, more flexible, and more private and accessible.

Researches around meditation mobile apps can be divided into two types. The first type is testing the scientific validity of meditation mobile apps by conducting experiments. The second type focuses on assessing its usability by analyzing online user reviews. Many studies have demonstrated that internet-based meditation programs can improve concentration [7] and reduce anxiety symptoms [8]. Several studies have conducted controlled trials confirming the positive effects of using meditation mobile apps on reducing user stress and improving well-being [9]. These researches provided scientifical evidence for mediation-related mobile apps.

Studies addressing user review analysis, on the other hand, pointed to negative user experiences with many of these apps. Examples include poor usability [10], which includes interface design issues such as poor layout, lack of readability, or ineffective navigation [11, 12]; and limited guidance on use [13, 14]. Mani et al. evaluated 23 mindfulness-based iPhone mobile apps using MARS [15]. The quality of the mobile apps was measured in four areas: stickiness, functionality, visual aesthetics, and information quality [15]. The results confirmed the finding that Headspace was among the highest-scoring positive mindfulness apps [9].

Headspace is a representative mobile application for meditation. It is an app that offers guided meditation, especially for beginners who are new to mindfulness. Puddicombe, the founder of Headspace, is a former Buddhist monk who leads each meditation session [16]. Headspace aims to cultivate a space where meditation is simple. It operates as an all-inclusive relaxation solution. Teaching eight sound meditation techniques derived from Burmese and Tibetan Buddhist traditions combines animation and audio to provide users with precise information [17].

Headspace has an extensive library of content, offering sleep-guided meditations and exercise videos, and focused music to promote the study and work for users, with different tutorials for various life scenarios. Also, users can choose different meditation lengths,

ranging from one minute to over two hours, depending on their preference and state.

Although previous studies have reported stress reduction and increased happiness after the use of Headspace [9, 8], neither of these studies investigated the user experience of Headspace in a straightforward way [16]. Hence, this study chose Headspace as the research object and aims to provide more evidence about user experience.

According to data from 14 November 2020, Headspace has a rating of 4.4 on the Google app and 4.7 on the apple store, indicating its good reputation. However, specific user perceptions and experiences are to be further explored. The study aims to explore the user experience of Headspace by identifying their perceptions and concluding possible improvements in the design of the current version of Headspace.

2. Methodology

Headspace is not a free app but provides a 7-day free trial when you subscribe to it for one month. Therefore, this study conducted research based on seven days using the experience of 4 users. The whole study adopts two methods from IDEO.

Firstly, given that Headspace is designed for beginners and the intimate nature of the meditation process, this study combined the extreme user interview with the user diary method. Diary research is a longitudinal approach that gives a self-report of users on specific aspects of their behavior and thoughts [18]. It helps the study to gain rich and in-depth insights into the authentic experience of users without interrupting them. Based on these self-reports, this study will analyze the perceptions of users and the challenges they encounter when using Headspace, thus identifying opportunities to improve the product.

While using Headspace, especially when following the guidance to meditate, many thoughts may pop up in the user's mind or need help describing their app meditation experience, which could create much redundant information for the study. Therefore, journal prompts (Appendix 1) which consist of open-ended questions, were developed to focus on the user's experience of using Headspace rather than the mental activity during meditation. Although these two are correlated, this study will not specifically explore the psychological effects of mindfulness on users due to the inability to measure mental effects.

Undoubtfully, the user diary method had some limitations, such as the difficulty in clarifying responses when the journal entries were unclear or indirect. Therefore, after collecting the seven days of entries, the study conducted an extreme interview with all the participants to interpret the meaning of their experience and achieve general feedback on the whole user journey.

The extreme interview is a way to gather insights from people who are either extraordinarily familiar or completely unfamiliar with the product [19]. In this case, the study only conducted interviews with new users with little or no knowledge of meditation. Second, due to the subjective nature of our data, participant journal entries need to be read multiple times to identify relevant codes and common themes.

This study applied the thematic analysis method to research collected user diaries and interview texts. Thematic analysis is widely used in qualitative research to uncover the 'structures of meaning' [20] that exist within the text. In this study, the highly subjective meanings derived from the thematic analysis revealed different perceptual outcomes of participants' use of Headspace program. By further integrating these meanings, the central themes of the users' combined experience of use emerged.

This study also applied the try-it-yourself method, which helps to empathize with users [19]. Though using the app for seven days, this research will conclude the present inconvenience and identify details where can achieve improvements.

3. Data Collection

The data collection process began with finding participants. Through posting invitations on social platforms via messages and emails to family and friends, this study firstly achieved 9 potential users. Once they were interested in joining this study, all the potential participants received a consent form to review and inform them of the aim and requirements of this study. A total of four participants were enrolled in this study. After receiving their signed and dated consent forms, journal prompts (Appendix 1) would send to participants to guide their journaling.

Participants had seven days to complete a sequence of meditation sessions with corresponding journaling entries. Participants submitted journal entries via the research email address. The question of the interview would be semi-structured. For each participant, the questions prepared are based on their journal entries and thus would be slightly different. Some of the questions would be focused on clarifying the journal entries and checking the explanation of personal experience.

The whole interview was recorded based on the participants’ consent. After reading through the interview transcript, a study compared the content with the journal entries accordingly and added annotations and notes to keep track of the themes that appeared gradually.

4. Data Analysis

Throughout data analysis, the repetitive words use from participant journal entries emerged into common themes (Appendix 2). These themes are perceived easiness of use, perceived hedonic value, perceived usefulness, and perceived price value.

4.1. Perceived Price Value

The price value is defined as consumers' cognitive trade-off between the perceived benefits of the applications and the monetary cost of using them [21]. In this study, price is the main barrier to use which was mentioned by 3 participants, who expressed a desire for lower annual subscription prices and suggested a student discount. Participant A responded, "The subscription price is a bit high and I don't think it is affordable to students. When I saw the price, ironically, I felt more stressed than before."

The four participants joined the experiment simply because they were interested in meditation and had no particular goals in pursuing certain benefits. Curiosity was their primary motivation for trying it out. They could uninstall Headspace easily when they finished the seven days so that they would have been more sensitive to the perceived monetary cost.

Headspace provides a student discount on their website. However, the mobile app does not provide any information about the student discount, not alone a cheaper price for student users. If a student user wants to get the student discount, they have to log in again on the website and verify their student identity through the institution. These several procedures complexify the subscription processes and thus add inconvenience for users to proceed.

All four learners were slightly annoyed when I reported that students could get a discount for subscribing from the website to them. Participant A asked, " Is this a deliberate cover-up?" Participant D was confused, "Why do they inconvenience everyone like this?"

Users' reactions reflect the distrust this unfair charging model has created among users. While student users can demand their discounts by complaining through online feedback, this has also caused significant inconvenience to users in terms of time and money.

4.2. Perceived Easiness of Use

Perceived easiness of use is the degree of ease when using the app [21]. In the technology acceptance model, it is also called "Effort expectancy" [22]. This study described it as perceived easiness of use to emphasis users' perception. Studies showed that there is a positive correlation between the perceived easiness of use and the tendency of using it over time [23]. Therefore, Headspace should be designed in a way that enables users, especially new meditation beginners, to simply practice and learn how to meditate.

Based on the result, Headspace met their goals. According to users' responses, generally the interaction design is user-friendly. Almost all users used the word 'simple' to describe Headspace interface, and the only confusion in use was that the favorite feature of Headspace which should help users to collect their preference is not effective. Related advice will be discussed in the suggestion section.

This study concluded that Headspace does a good job in terms of perceived ease of use. Regarding the content, all participants agreed that the inclusion of breathing exercises in the daily sessions had given them a new perspective on meditation. Participant A mentioned in his diary on the first day, "Before using, I never thought breathing is also a kind of meditation and I was surprised it is one of the keys of mindfulness. The breathing exercises are very simple and natural, unlike what I thought would require a lot of concentration". Participants B, C and D also commented on the sustainability of the breathing exercises in their diaries, such as "... I started to look forward to the daily breathing exercises." and "Breathing exercises are becoming a daily routine for me and I think I will use this breathing method when I am nervous in the future."

The inclusion of breathing exercises as part of the daily training enhances the perceived ease of use of new users to meditation training and to a certain extent facilitates beginners to follow the instructions and complete the daily practice more easily.

4.3. Perceived Hedonic Value

Hedonic value is perceived as the pleasure that achieved during the use of technology. It has been shown that hedonic motivation such as enjoyment and playfulness is essential in technology acceptance [21]. Meditation, a mental activity closely related to psychological perception, inevitably generates some subjective emotional experience for the user. In this perceived hedonic value is a prominent part of users' diary data.

Words that reflect positive emotional perceptions, such as "relaxed," "comfortable," and "I feel relieved," appear in users' diaries almost every day. This perception of hedonic value is partly due to the mental boost provided by meditation training and the pleasure

of using the interactive interface with its animations, sound effects, and other design features. The user diary describes how this perceived hedonic value is created from three perspectives: visual, auditory, and tactile.

Visually, the most striking aspect of Headspace's interface design is its color palette and combination of cartoon images. The first day's user diary records the users' first impressions of Headspace, as mentioned by users A and D. "I was curious about Headspace when I first downloaded it because of the attractive logo, which is an orange circle. "User D liked the overall color palette of Headspace, "Headspace's colors are predominantly warm colors like orange and yellow. When doing breathing exercises, the page is also a warm orange color, which echoes its logo in a lovely way. All participants mentioned the cute cartoon images used by Headspace. When asked if they found the cartoons childish, the participants did not give negative comments. Instead, they felt that the cartoon look, which is neither a portrait nor a flora or fauna, was approachable and gave the user a fun experience. In addition, the visual animation also impressed the participants.

Aurally, Headspace designed different music for each session, and some participants chose to close their eyes during the breathing exercise. User C said, "closing my eyes and following the music to take deep breaths made me feel soothed." During the interview, User C further described the feeling of the music, "The breathing music made me feel like I was on the beach. The soundtrack was like the sound of the waves and sand being gently whistled by the wind." This perception of sound was particularly evident during the seventh and ninth use sessions. Users A, C, and D referred to the cat's purr in the seventh session, "The design helped to make my breathing exercises a lot more interesting." "The cat's purr is just so cute. I think the design is very creative." Users B and C noted that the white noise in the background of the ninth session added to their positive emotions. "I like the sound of the campfire burning, especially before bedtime, it feels relaxing to me."

Tactilely, Headspace was set to vibrate at different frequencies during the breathing meditation sessions. In the initial first three days of the diary, all four users were surprised by design, which "felt very advanced." "The change in vibration frequency reminds me of the game in switch, and I did not expect Headspace experience to be so richly designed. "User B also mentioned how the vibration design brought a similar feeling to playing a game, "The vibrations added so much interactivity to the meditation process. It was refreshing, just like playing a game when I was a kid".

4.4. Perceived usefulness

Perceived usefulness is an essential part of health-related applications [22]. Davis defines perceived usefulness as the extent to which a person believes using a particular technology will improve his or her performance at work [24]. Health-related applications tend to promote themselves by citing research supporting their usefulness claims. Headspace has adopted the same strategy. There are many references to the benefits of Headspace on its website and in the use of Headspace [25]. It claims to be "the most scientifically based meditation app" [25]. In terms of Headspace's functionality, the utility it seeks to achieve is primarily centered around the spiritual realm, such as releasing stress and improving concentration.

According to overall user evaluations, many people report that the meditation practice has somewhat improved their mastery of daily tasks. Participants A and C usually used the app at night when they were ready for bed, which enabled them to eliminate excess thoughts and clear their minds before bed." The quality of my sleep has improved recently. Using Headspace is now becoming my sleep routine." Participant C replied. At various points in the diary, all four participants mentioned an improved quality of life, such as "I have been emotionally stable" or " have a good sleep recently." Users attributed this self-perceived improvement in their lives to the use of Headspace, reflecting their trust in the effectiveness of its use. This functional recognition represents a high level of acceptance of the content design of Headspace course.

Interestingly, none of the four participants had any intention of continuing to use Headspace. However, they all agreed that there is a positive impact in their quality of life during their use. This perceived usefulness fell short of what they would be willing to pay. Furthermore, they were independent of Headspace during the seven days of use, even though the app has a game-like punch card design that fosters user stickiness.

5. Try-it-yourself Analysis

Before signing up for the free trial, users will go through the pre-subscription stage. As the user diary only records the user's experience of the ten sessions over a seven-day period, this study used the try it yourself approach to record and summarize the process of pre-subscription. The flowchart below

presented the process which is divided into “Basic Setting Stage” and “Concepts Experiencing Stage”.

In the first stage, goal setting helps users to clarify their motivation for use and facilitates the subsequent personalization of the course for them.

The breathing exercise is the core idea of the concept experience stage. The breathing exercises in this stage create a comfortable and harmonious visual

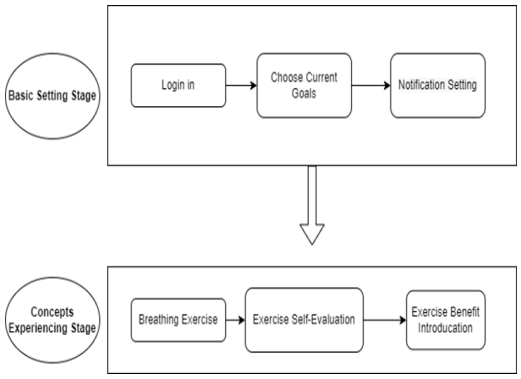

Figure 1. Pre-subscription Flowchart

image with a blue sky and white clouds as the background. The breathing exercise consists of three slow, deep breaths and takes around one minute; Headspace makes this exercise enjoyable and simple through easy-to-understand animations. When users were asked how they felt about this stage, they mainly mentioned words such as "fun" and "cute." Among them, participants B, C, and D all mentioned their expectations for subsequent use. For example, "I was surprised that the meditation practice could be so easy, and I think the following sessions will be more interesting." At this stage, the users had yet to start using Headspace. However, this breathing exercise, without difficulty, gave the users a favorable impression and expectation of using Headspace. In addition, the evaluation stage after completing the breathing exercise also serves to help users measure the utility of using it and can help them establish a system for assessing the effectiveness of the application utilization, making the whole system seem scientific and user-centered.

Above is the entire content of Headspace for free users to experience. Subsequent use requires subscription to unlock. The question is, does an experience of just under 2 minutes motivate users to subscribe? Although users can unsubscribe at any time during the free subscription period, the subscription process is still time-consuming. It inevitably increases the perceived risk of forgetting to unsubscribe, for example. This study suggest that Headspace add two more features for free users to try out and extend the pre-subscription period.

In addition, during my use of Headspace, there was a synchronization problem between iOS and Android. When I finished the exercise on my iPad, my phone still showed that tasks still needed to be completed. Even when I refreshed my phone, nothing changed. This fragmentation between the systems did not cause me any trouble in using it, but it negatively affected my evaluation of the reliability of Headspace technology.

6. Suggestions

Based on the user perceptions gathered and my experience, this research suggests two main areas Headspace could improve: usability and billing issues. Usability issues include device out-of-sync problems and disorganized favorites. Billing issues mainly focus on unfair subscription charges.

6.1. Desynchronisation of Devices

The fragmentation between platforms of different systems affects the stable operation of the application. Headspace usage process on different devices for the same account was not synchronized after the user complete the daily session. This can be confusing for users who are used to tracking their progress and clocking in their own progress, which can be inconvenient.

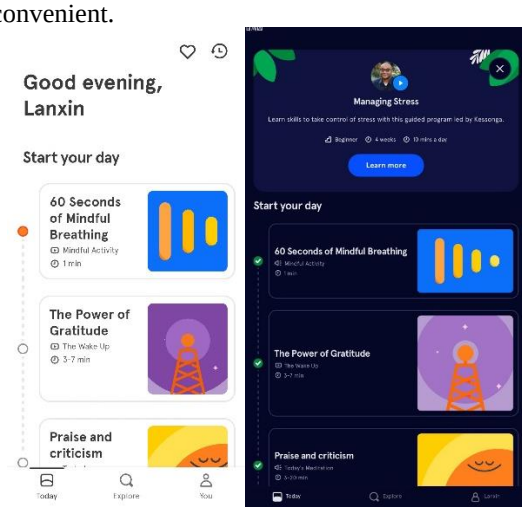

Figure 2. Desynchronisation of Devices

The image on the left shows Headspace interface for Android, and the image on the right shows Headspace interface for iOS. The green ticks in the right image reflect that all the daily exercises have been completed, but the progress on the left shows different states where tasks are waiting to be finished. Although this does not affect the user's usage, this

unsynchronized system problem may cause users to perceive it as unprofessional and unreliable, affecting their propensity to continue using it. Hence, this study suggests. Headspace should improve the synchronization rate across devices and ensure that account usage records are kept up to date.

6.2. Disorganized Favorite Functions

As shown in the figure 3, Headspace favorites function is achieved by clicking on the love button of a course.

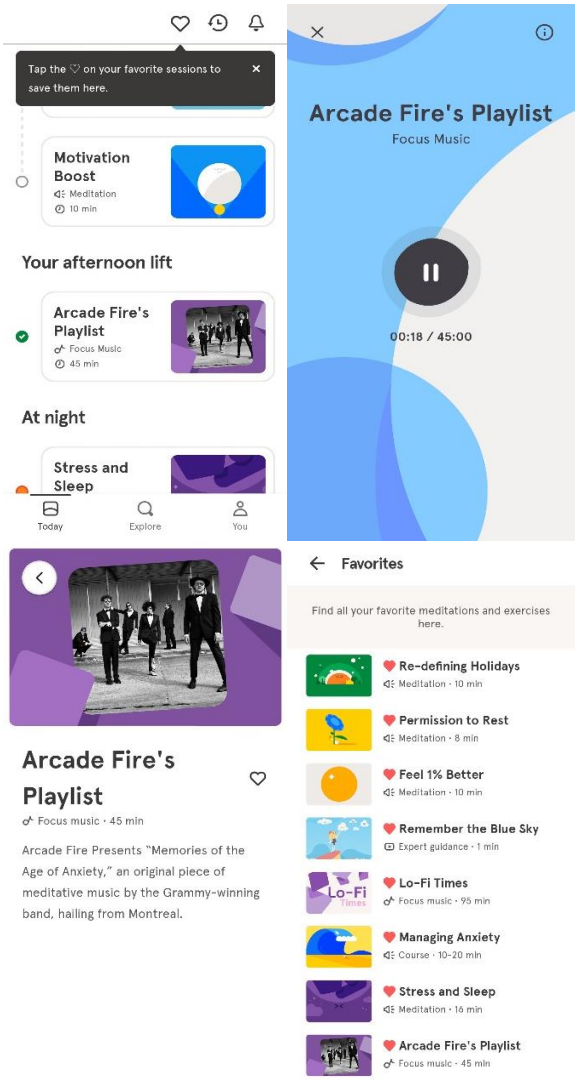

Figure 3. Favorite Functions

However, when a course is playing, the user cannot see the love button directly on the page. The user must click the information button at the top right of the page. Then it takes them to the course's details page, where they can see the love button on the right.

This process could be simplified by adding a love button on the playing page. Also, after users bookmarked many courses, the favorites show the bookmarked content in the order of when they were added. While users can see which categories the favorites belong to, as the icons all look similar, users cannot find what they want to review directly and quickly.

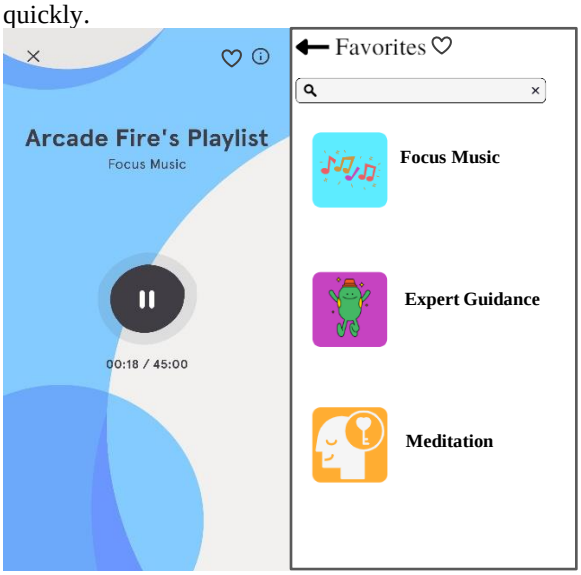

Figure 4. Prototype of Favorite Functions

In short, Figure 4[1] shows a possible prototype that simplifies the favorites function by putting the favorites button in a more prominent place and categorizing favorites by topic. Additionally, adding a search function on the top can facilitate users once they want to find some resources in the collection. The updated version would be more efficient when users collected a lot of content.

6.3. Unfair Subscription Charges

A fair billing model should maintain the availability of discounts. The current login screen for Headspace mobile app does not indicate that student users are entitled to a subscription discount. Only student users who are logged in on the website are aware of and able to access the student discount. It not only results in extra money being spent by students who only use the mobile app, but it also inconveniences those who want to access the student discount as they have to open their computers to log in to the website. Headspace should, therefore, clearly

[1] Figure 4 is made through Canva and only applied free content.

display the discounts that student users will receive for subscribing on the login screen of the mobile app and allow students to register and subscribe from the mobile terminal quickly. The verification of student status could refer to the verification process of Spotify, which verifies the registration status of users through SheerID's third-party service.

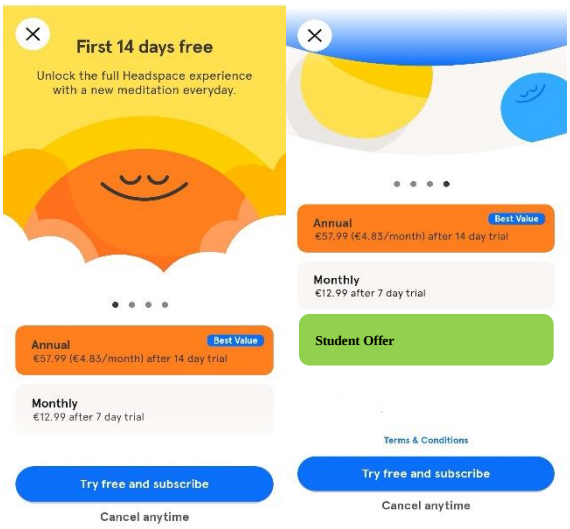

Figure 5. Subscription Page: before and after

7. Conclusion

This study used content analysis in qualitative analysis to assess participants' experiences of using Headspace. Guided by TAM theory and UTAUT theory [22, 21], the study conducted a thematic analysis of user diaries and user interviews to generate five dimensions of user perceptions: perceived easiness of use, hedonic value, perceived usefulness, and perceived price value.

The perceived price value dimension identified negative perceptions of Headspace in terms of pricing strategies and payment models, which should be improved by increasing the promotion of student discounts on the mobile app. Meanwhile, in the perceived usefulness dimension, while users recognized the usefulness of Headspace in improving sleep and relieving mood anxiety, this effect failed to reach the extent that they were willing to pay for it. The lack of effectiveness and the high use cost are the main reasons for users to abandon the using of Headspace. This result is similar to Peng et al.'s study, which highlighted the cost of the app as the main factor preventing users from using the health app [26].

On the perceived easiness of use dimension, Headspace received a lot of positive feedback, as the appropriate course content built up users' interest in meditation. However, easiness of use could still be improved by perfecting the collection function. Specifically, the user experience could be improved by simplifying the collection process and increasing the categorization of content in the collection, making the process more efficient. In TAM, perceived usefulness and easiness of use were the two main predictors of continued system use [27]. However, the results of the current study did not reflect on this point, as Peng et al. showed that perceived usefulness was enhanced and influenced participants' willingness to use when they needed to build a habit through a health app [26]. Considering the participants in this study only joined the research for interest with little need or motivation to use, it is possible that their perceived usefulness did not translate into motivation to continue using.

Finally, the outstanding perceived hedonic value of Headspace application is unique, with users showing a high level of satisfaction with the design of its interface, the video dubbing, and other interface aspects. The animations that perfectly match the content of the courses bring much pleasure to the process, which is the main reason behind the positive feedback from four participants. This supports the findings of Yuan et al. (2014) that exciting features and designs positively encourage users to continue using health apps. Hence, this research suggests Headspace should utilize their appealing gamification to attract more beginners join the journey by adding more free exercises before users' subscription.

Overall, the sample size of this study is small, and therefore the generalizability of the conclusions drawn requires further testing. However, the data collected by user diaries is reliable and the suggestions of this study that based on user feedback provided a direction for subsequent updates to Headspace.

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9. Appendix

Appendix 1.

DIRECTIONS FOR JOURNALING
The study requires you to complete all 10 meditation sessions within 7 days after subscribing to the monthly plan and start your first meditation by 2 November 2022. Due to the time constraints of this study, you must complete all sessions by 24 November. In each session you will complete a meditation session and then keep a journal to reflect on your experience of using it. You can write your comments in any form at the beginning, either handwritten on paper or typed in a document; however, this study requires you to write all your reflections in a Microsoft Word document after completing all 10 sessions. If you handwrite, please also keep clear photographs that you have taken in one document. When you have finished, please send all 10 journals to Lanxin.zhang@ucdconnect.ie. The study recommends that you start in a place where you will not be distracted, open the application and begin meditating. After using the meditation app, please take 10 minutes to reflect on your experience. **Please refer to the following journaling prompts to help you reflect and write down your journal entry.** Talk about anything that comes to mind about your experience, such as thoughts on design, functionality, presentation, navigation. Only after answering the above prompts, talk about anything you might want to add that relates to your mental experience, such as changes in mood, changes in mental state. Thank you for your support and participation in this study.

Appendix 2.

Main Theme	Sub-theme	Example
Perceived price value	High subscription fee	The cost is a bit too much
	Ineffective student discount	How could they know there's a student discount
Perceived easiness of use	Clear navigation	User friendly with topics to guide you
	Simple breathing exercise	I didn't expect the breathing exercise could be so easy and fun
	Defective favorites	It could be better if they can categorize the collections
Perceived hedonic value	Pleasant UI design	Good UI design
	Interesting animation	The animation is so cute
	Advanced vibration design	Totally surprised by the vibration
	Relaxing music	Love the focusing music, very relaxing
Perceived usefulness	Improved sleeping quality	Recently my sleeping quality improved
	Stable emotions	It helped me stay grounded amidst the chaos of study
	Reduced stress	It has helped me to deal with my stress

Appendix 3.

Throughout the module, we did several exciting group activities, and almost every time, we were asked to switch positions, sometimes taking on different roles, such as recorders, and other times taking over the work of our teammates, such as changing jobs during robot building. Initially, I thought these group activities were designed to develop our spirit of cooperation. Although this was an essential part of the design, now I prefer to say this change of roles and tasks was more a way of developing the ability to see the design from a different perspective or to observe.

This perspective of observation is not simply to look at and record but to relate things to pay attention to the influence and communication between different elements, and we can get closer to this perspective by using some methods. I remember my time-lapse assignment filming traffic flow at a traffic light junction in Dublin. In that film, I found that the image I usually took for granted resulted from a systematic design. The sense of order in the video made me suddenly realize that the world I was in was somehow like a designed machine. Traffic lights, pedestrians, vehicles, drivers. These things are arranged to function by systematic rules; they are interconnected and communicate with each other. Time-lapse photography, as well as the character shifts and task transitions mentioned above, is a perspective of observation that I prefer to call the perspective that a designer must have.

I particularly like an observation by Yoo et al. (2016), "treating the word design not as a noun, but as a verb."(p.215)". I still agree with this definition that design is an act rather than a form of the output of something. So, what is a successful design? What is a good design?

Inspired by Pixel's article (Catmull, 2008), I think good design doesn't have to be defined by the user; the participants can also explain the good design. A design is a temporary success if the capabilities of each participant are fairly catalyzed and utilized in the process and a shared vision is agreed upon by them.

Although I often feel painful when I read papers on software development, I have made some gains of my own in these articles. Whereas I used to think of a programmer's job as being very precise and accurate, I now know that there is a lot of mud hidden behind programs that seem to run (Foote & Yoder,2000). Someone like me who is not a good communicator might be well suited to becoming a programmer so that I don't have to talk to people. But the chaos model has shown me how important communication is in software development (Raccoon, 1995).

I don't always communicate well with my classmates, but I tried to improve my presentation skills and show a more open communication state. In the assignment on defining design, I wrote that design is a never-ending learning process. In fact, our lives are our most important designs. We plan, organize, adapt the rhythm of our lives to different situations, and, above all, observe ourselves and improve ourselves through interaction with the outside world. From this perspective, my design for myself has gained some new ground in this design module.