



A PILOT STUDY OF USING DIARIES METHOD FOR COLLECTING SPIRITUAL EXPERIENCES DATA AMONG OLDER ADULTS

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ABSTRACT

The increasing number of aging populations worldwide versus vast developments in mobile technology creates questions on how older adults adapt and apply mobile technology in their daily life. As older adults is said to be more spiritually inclined, thus, mobile spiritual applications can work as medium of serving the older adults spiritual needs. A lot of HCI work still need to be done to ensure the development of spiritual apps is tailored to older adults needs. Therefore, the objective of this study is to evaluate, from an older adult's perspective, the most workable diary design to collect spiritual experiences data by using an Android mobile application known as Quran Bahasa Melayu. Older adult participants were selected based on snowball sampling technique to use mobile spiritual application's using a tablet PC for seven consequent days. The participants were asked to fill up three different types of diary which are daily diary, structured diary and also 3E diary to find out the diary design that works well with older adults. Daily diary appears to be a good tool in describing older adult daily activities in detail, while structured diary fails to achieve any target. 3E diary manages to record very rich data pertaining older adults feeling, emotions and experiences in terms of facial expressions from the drawing and written text. Therefore, this case study suggests that 3E diary is the most workable diary design in capturing spiritual experiences data among group of older adults while engaging mobile spiritual applications and interview method could be used as complement method to the diary.

Keywords: techno-spiritual, elderly, user experience, older people, 3E diary, qualitative research.

INTRODUCTION

Ageing scenario is a universal phenomenon faced by European states, Japan, China, USA [1] including Malaysia due to the fertility decline and also increased longevity [2]. The cornerstone of ageing scenario worldwide is independent and successful ageing to ensure older adults physically, mentally and spiritually healthy [3]. Several strategies have been developed to support successful ageing, including the development of assistive technology to monitor older adult's health, technology to support cognitive impairment, technology to enhance family bonding among elderly and the most important is spiritual technology to assist older adults to be physically and mentally balanced.

Previous studies of the older adults states that they will turn to spirituality and religion during their later age as a source of rejuvenation and healing from life problem and losses [4]. Even though, there are a lot of spiritual applications in mobile market [5] but the apps are not always adapted to older adult's special abilities and needs [6]. Additionally, there is lack of user experience evaluation studies been done for mobile spiritual applications [7] for older adults. According to previous study by [8], discovers that diaries can effectively exploring both older men and women issues pertaining their daily lives, hence, diaries also can act as a reflection of experiences by older adults. With the recommendations of using diary method with older adults from previous scholars [8, 9], we ought to find that diary can offer some insights on their spiritual experiences during engaging the spiritual applications. Therefore, in order to facilitate older adults access to mobile spiritual applications, the present

works reviews HCI methods in capturing spirituality experiences of older adults while using spiritual apps. This study aims to answer the following research questions:

1. Which is the most suitable diary design to be used in collecting spiritual experiences data among older adults?
2. Do we need any other methods to complement diary study or the use of diary solely is enough to capture the data?

MOTIVATION FOR USING NATURAL APPROACH

Case study: user experience (UX) evaluation using interview and observation method

In our previous study [10], an interview and observation studies have been done in order to collect spiritual experiences data by using spiritual applications among eight older adults. The study was implemented by using interview and observation methods by recording the audio and video during the interview session. Analysis of data was then done to analyze spiritual experiences gathered from each of the session. Results from the study reveals that an interview and observation methods are able to capture spiritual experiences data of older adults while using the spiritual apps, however, the level of deepness and richness of data is insufficient, since the researcher are focusing on the aspect of affective, emotions and feelings experiences.

User experience evaluation tools

[11] defines user experience as evaluative feeling when using products; and UX put attention on humans



affective and feelings compared to other aspects. There are many methods available in HCI to assess the user experience towards using the products including interview, observation, diaries, questionnaire, storytelling, experiments and questionnaire [12]. According to [13], diaries for instance, can provide rich source of research data when working with older people where the duration for the diary study can be in the range of 1 to 2 weeks. This naturalistic approach allows older adults in expressing their thoughts and feeling in an earthy way compared to field settings where it is quite difficult to observe users and gauge their attention without affecting user experiences [14]. Diary is considered as very personal, being written in private and not intended to be shared with others [13]. It is applicable to use diary in collecting spirituality type of experiences since spirituality as stated by [5] in certain communities and tradition is considered privacy and inappropriate to be shared in public. Moreover, the chosen tools to collect spirituality data should encompass real-time, writing once the task encountered in natural daily practice, hence, the activity should minimize the influence from the researcher during the evaluation.

Previously, there is a lot of human computer interaction (HCI) studies that concentrates on an emotion assessment tools including PrEmo, Emocards, Self-Assessment Scale (SAM), AttrakDiff, Experience Clip, Expressing Experiences and Emotions (3E) and many more used in HCI studies [12]. Considering a few aspects of this study including the user age category, applicability for field study evaluation, ability to capture emotion assessment in drawing and writing in a semi-structured way and also easiness of the tool, therefore, 3E diary has been chosen to be used in this study.

METHODS

The participants

The criteria for the participant recruitment were that participants had to be age 60 years and above, living in Selangor and must be digitally engaged, meaning that he/she must have at least an experience of using mobile phones. Age 60 and above is categorized as elderly in Malaysia by the government [15]. Since this pilot study was to determine the workable diary design to capture spiritual experiences data among older adults, therefore, the total number of participants who was selected is two people. According to [16], one or two users in a pilot study are generally enough for conformance of a subject matter. The selected participants were two older adults, one female, 60 years old and one male, 62 years old. Both older adults take part as participants voluntarily after being approached by researchers. At the end of the study, researchers compensate money for their effort and willingness to participate in the study.

Evaluation strategy

This study comprises of five processes as shown in Figure-1 below, which are a selection of case study,

ethical considerations, pre interview, diary study and post interview.

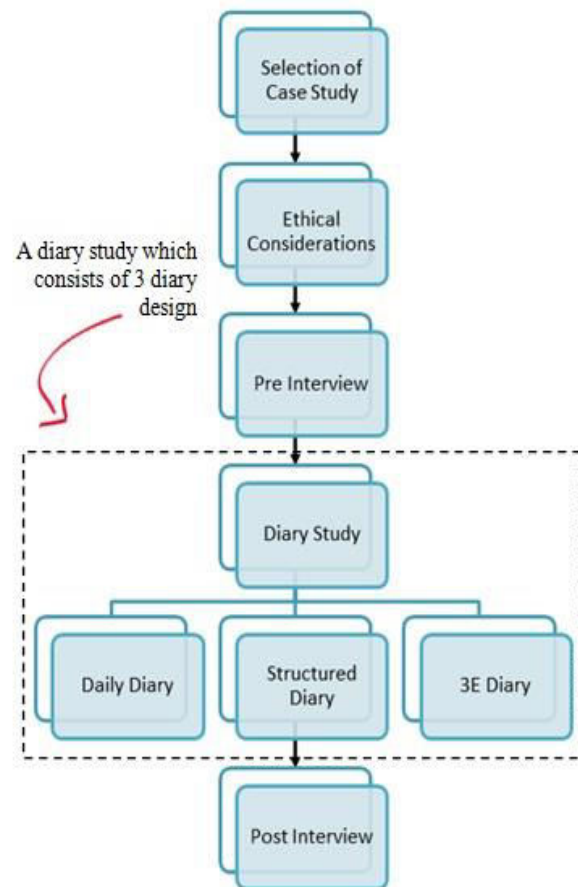


Figure-1. Research design.

Selection of case study. In the first process which is a selection of case study, participants who stay in Selangor was being selected as a subject area of study. Selangor was chosen as the study area because it has a high population density among all states in Malaysia [2]. The snowball sampling approach was used to locate digitally engaged participants. The selected older adults should be in the category of digitally engaged where they must at least have an experience of using mobile phone.

Ethical consideration. Previous study by [17] highlights the guidance on involving older adults in a study. Researchers follow few steps as highlighted by the study with older adults since older adults are categorized as sensitive users. Firstly, researcher's make an appointment to come to the participant's house for a pre-interview session. Formal letter to conduct the study from university was presented during the visit as a formality to give brief explanation about the study. Once the participant agreed to participate, the participant itself sets their own time to allow researchers to come to their house for the interview session. In the pre interview session, older adults were asked a permission to sign a consent form and they were informed about the audio and video recording along the study. At the end of the study, researchers express gratitude by saying thank you and



gave small monetary voucher for participant's willingness to participate in the study.

Pre interview. The study starts with an in home pre interview session as in Figure-2 and Figure-3 by using a semi structured questions. This pre interview session aims to obtain participants' background, their experiences of using mobile phones as well as experiences on using mobile spiritual applications. They were also asked to rank the most important mobile spiritual apps based on the list of spiritual apps given by the researchers. Next, a demo video on how to use the app was shown to the participants and at the same time researcher assists the participants to use the app. Finally, a set of cultural probes was then handed to the participants with a briefing on how to fill in the diaries.



Figure-4. Cultural probes.



Figure-2. Pre and post interview sessions with P1.



Figure-3. Pre and post interview sessions with P2.

The cultural probes (refer Figure-4) were used to enable older adults reporting and expressing their emotions while using the Quran Bahasa Melayu application's in a week. The probes contain the following:

- A 7 inch Tablet PC with Quran Bahasa Melayu application installed
- A Quran Bahasa Melayu application demo video installed in the Video Gallery
- A pen
- A set of Diary, 3 pages of diary per day (Daily diary, Structured diary and 3E diary)

Diary Study. There are three types of diary design being used in this study, which are daily dairy, structured diary and also 3E diary. The following is the explanation for each of the diary type.

The first design is the daily diary. Each participant was asked to write their 7 days activity daily based on the following time slot:

- Morning, 12.01am – 12.00pm
- Evening, 12.01pm - 7.00pm
- Night, 7.01pm - 12.00pm

Before handing the diary to the participant, they were asked to fill in the diary based on their free time. They were also advised to fill in whatever events or feelings they want to share with the researchers.

The second diary design is the structured diary. After writing the daily diary, older adults were asked to answer three questions provided in the structured diary. The question in the diary is particularly asking about participant's feelings and emotional experiences while using the Quran apps. They were also required to report on the duration of using the apps and the functions that they use while using the app. In order to remind the participants to not forget to report in the diary every day in a week, the researcher called, messaging or whatsapp each participant's almost every day to remind about the diary and asking if there is any problem of using the diary or the apps.

The third design is the 3E diary. For 3E diary, the older adults are required to fill it only if they used Quran apps for that day. They do not need to fill in the 3E diary if they did not recite Quran from the apps since the 3E diary purposely used for user experience evaluation after the user do the task. 3E diary was used in this study because the tool is able to capture user emotional and feeling experiences in natural environments. Older adults can also express their feelings naturally in a non-serious format. Some improvements have been made to the original 3E diary as in Figure-5, to give more understanding to the participants that they need to record what they feel, thus, a heart symbol has been added to the tool as follows.

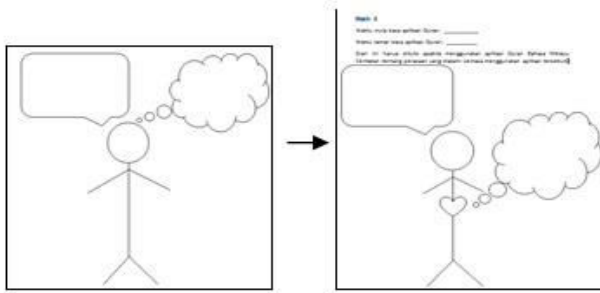


Figure-5. The edited version of 3E diary.

Post interview. Researchers set up time to meet the participants at their house after a week. These follow-up meetings were also audio and video recorded for research observation purpose. The purpose of doing a post interview is to seek clarification from participants about the drawing in the diary as well as a detailed description to the text written in the diary. The post interview session was divided into two parts. Firstly, participants' were asked about their experience of using the Quran apps and the all three types of diary. Secondly, is the user experience evaluation involving a set of measurements pertaining interaction, presentation, content and functions of the Quran Bahasa Melayu apps.

RESULTS

Participants background

Participant 1 (P1) is a grandmother living with her husband and raising her three grandchildren while her daughter going to work. She already retired in year 2006 from a Malaysian airline company. Her highest education achievement is secondary school. Currently, she does not have any age pertaining disabilities where obviously she can read without using spectacles, she can use all mobile phone functions and is healthy. She has more than 10 years' experience of using mobile phones; previously she was using the Blackberry mobile phone and once she lost it, her son-in-law bought a Samsung mobile phone (refer Figure-6) as a gift and she enjoys using the mobile phone model very much. During her working years, she has few diaries (refer Figure-7), which she used to write cooking recipes, daily working task and to jot down important event.



Figure-6. Participant 1 (left) and Participant 2 (right) mobile phones.



Figure-7. P1's old diary.

Participant 2 (P2) is a grandfather living with his wife, a son (29 years old) and his son's family and a daughter (17 years old). He retired in 2011 from a Malaysian housing and an estate developing company. His highest educational achievement is a Lower Certificate of Education (LCE) at age 15 years old. He currently does not have any age pertaining disabilities and is healthy. He has used mobile phone since year 2006 and the model is Nokia. He has used Nokia since 2006 (refer Figure-6) and refuse to replace it with another model for the reason that he only knows Nokia functions and worry if he unable to learn the other model. He uses diaries when he still works to jot down important things for the reminder. His hobby is planting in the nearby orchard every morning.

Participants feedback

Selection of mobile spiritual application. From an interview session, both participants were asked to rank spiritual apps that they deemed important to be installed in their mobile phone. Both of the participants choose mobile Quran as the most important applications that need to be installed on their cell phone. This finding was similar to previous study that unprecedented with 8 older adults [10]. Among the other applications that are deemed important for them is a collection of Du'a (prayer), Mobile Adhan (prayer reminder) and medicine in the manner of the Prophet Muhammad SAW.

In the pre interview session with P1 that lasted about 45 minutes, it was observed that the level of concentration in answering research interview questions is only for the first 30 minutes. After 30 minutes, P1 started to grab her mobile phone and checking for whatsapp messages from her daughter and relatives. The interview session was distracted for about 1 to 2 minutes before the researcher started asking back questions. P1 was not hesitating to answer the remaining questions, but her attention was towards her holding mobile phone.

It is also observed that both participants show their shyness in the pre interview session. They only answered to researcher's questions where the situation differs in the post interview session where both participants express their openness in answering questions for instance sharing their past life experiences, especially in spiritual practices, hobbies and telling about their hopes and dream.



Results of daily diary. Results from the daily diary as in Figure-8 reflects that older adults really enjoy writing their daily routines. P1 and P2 for instance, share their daily routine in details and write precise time for each reported activity, for example:

P1: "14.00. Once atok was back home from performing Friday prayer, ummie going upstairs to bath again, and perform Zuhr prayer and read the mobile Quran.

14.44-15.05. Read about 20 minutes. The battery is going to run out and ummie wants to charge it first."

P2: "5.15 am going to the mosque and listen to Fajr lectures → 7.30 am

8.00 am-10.30 am → Orchard

11.00 am-11.20 am → Read Quran"

Diari Harian Penggunaan Aplikasi Spiritual

Dianjurkan untuk mengisi pengisian setiap hari menggunakan aplikasi spiritual ini.

Nama: P1

Tgl: 11/12/14

12.01 pagi: 1.00 pagi bangun tidur, ambil air, mandi, pakai baju, makan, pergi ke masjid, baca Quran, 1.30 pagi makan, 2.00 pagi baca Quran, 2.30 pagi makan, 3.00 pagi baca Quran, 3.30 pagi makan, 4.00 pagi baca Quran, 4.30 pagi makan, 5.00 pagi baca Quran, 5.30 pagi makan, 6.00 pagi baca Quran, 6.30 pagi makan, 7.00 pagi baca Quran, 7.30 pagi makan, 8.00 pagi baca Quran, 8.30 pagi makan, 9.00 pagi baca Quran, 9.30 pagi makan, 10.00 pagi baca Quran, 10.30 pagi makan, 11.00 pagi baca Quran, 11.30 pagi makan, 12.00 tengah hari makan.

Diari Harian Penggunaan Aplikasi Spiritual

Dianjurkan untuk mengisi pengisian setiap hari menggunakan aplikasi spiritual ini.

Nama: P2

Tgl: 11/12/14

12.01 pagi: 1.00 pagi bangun tidur, ambil air, mandi, pakai baju, makan, pergi ke masjid, baca Quran, 1.30 pagi makan, 2.00 pagi baca Quran, 2.30 pagi makan, 3.00 pagi baca Quran, 3.30 pagi makan, 4.00 pagi baca Quran, 4.30 pagi makan, 5.00 pagi baca Quran, 5.30 pagi makan, 6.00 pagi baca Quran, 6.30 pagi makan, 7.00 pagi baca Quran, 7.30 pagi makan, 8.00 pagi baca Quran, 8.30 pagi makan, 9.00 pagi baca Quran, 9.30 pagi makan, 10.00 pagi baca Quran, 10.30 pagi makan, 11.00 pagi baca Quran, 11.30 pagi makan, 12.00 tengah hari makan.

Figure-8. Daily diary reported by participants.

P1 also stated in the diary that writing in the diary is as the same as writing a short story. From the data in a daily diary, researchers can identify P1's and P2's daily activities and its pattern, however, there is no even single expression of the participant's experience and feelings on using Quran app's stated in the diary. It clearly shows that

daily diary works well in gathering participant's routines and activities, but it does not work well in capturing the participant's experiences especially the feelings and emotions data.

Results of structured diary. In structured diary as in Figure-9, participant's reported the duration taken to recite using Quran apps and also the apps function that they used for that day. P2 in the diary reported about his feelings before and after using the app, "At first fear because do not know how to use it, but when I understand completely I think it will be fun and useful". Besides, P1 writes the steps that she did before starting recite the Quran from the tablet PC. From the results in structured diary, depicts that participants express their usage experience, especially on the total time allocated to read Quran apps, the feelings after using the apps and also the app's function that they used during the recitation. User experience data for both participants was recorded, but in just a few lines, there are also few days that P1 and P2 did not record anything in the structured diary as in Figure-9; therefore, the use of structured diary of older adults is arguably less successful.

Diari Harian Penggunaan Aplikasi Spiritual

Soalan 1. Berapa lama masa (minit) yang diambil untuk membaca Quran menggunakan aplikasi pada hari ini?

Soalan 2. Apakah perasaan Tuan/Puan semasa menggunakan aplikasi Quran Bahasa Melayu?

Soalan 3. Tandakan (✓) pada fungsi yang digunakan di dalam aplikasi Quran Bahasa Melayu pada hari ini?

☐ Audio bacaan Quran ☐ Penanda halaman

☐ Carian ayat ☐ Besarkan/Kurangkan saiz tulisan

☐ Padam bacaan ☐ Perubahan kontras

☐ Ayat (Bahagian) ☐ Tambah nota

Figure-9. Structured diary reported by participants.



Results of 3E diary. Results from 3E diary as in Figure-10 obviously able to capture participant's feelings and emotions, experiences richly through seven day experience of using the apps. The diary as presented in Figure. 10 was surprisingly beyond researcher's expectation. At first, participants were brief on how to write and draw in the diary; participants are given the freedom to fill the diary in accordance with their own creativity. Both participants initially told that they do not know how to draw, but the result is very impressive since they write and draw to show real feeling and emotions. P1 for example, sketch pictures of people crying to express that she was so sad when reading the verses in the Quran.



Figure-10. Drawing and written text in 3E diary by participants.

P1: "It is happy...be able to appreciate the meaning of each verse since the meaning is shown below the verse. Feelings of sadness... the fear... the feeling of repentance, many sins to God. As humans, so many sins, sometimes do not read the Al-Quran for long time"

P2, reported on his not confident feelings about his ability to use of the Quran apps on the tablet PC in the beginning. Through the 3E diary, he initially expressed feeling of worry because do not know how to use the application. The lapse of a few days later, he reported that he eventually success and able to use the apps and often use it to help him memorize the Quran verses.

User experience evaluation analysis. The analysis of user experience evaluation was discussed based on the data gathered from the combination of structured diary and 3E diary. Data from the daily diary was excluded since researchers could not find any related user experiences information reported in the diary. The following Table-1 highlights participants' feedback from the diaries, especially the 3E diary.

Table-1. Participant's feedback captured from the diary.

Num	Diary data on day basis
P1	Day 1: "It is happy ...be able to appreciate the meaning of each verse since the meaning is shown below the verse. Feelings of sadness ... the fear ... the feeling of repentance , many sins to God. As humans, so many sins, sometimes do not read the Al-Quran for long time"
	Day 2: "Before sleep, must recite Du'a, Zikr and Ayatul Kursi, the usual practice of remembrance. Prevent myself in the world and hereafter . Inshaa Allah"
	Day 3-Day 5: Participants reported that she did not recite Quran from the Tablet PC because she is ill.
	Day 6: "I feel calm and humble when I'm able to read the Quran translation in the app. How God Almighty commands his servants to repent for all our sins because God is ready to accept repentance"
	Day 7: "Tonight I didn't open and read Quran from the apps. Sitting here all alone and writing the diary, my heart says it feels like writing a short story"
P2	Day 1: "Can I recite Quran from this app. I feel a bit worried "
	Day 2: "Already confident and fearless to conduct this app on my own, very fun to learn new thing"
	Day 3: "I felt happy because already know how to use it. It feels like a duty to recite from the app"
	Day 4: "I'm sorry, I cannot use the app for a long duration because my eyes become pain and unclear "
	Day 5: "I still use the app to recite Quran, but it cannot be too long"



DISCUSSION

Based on our study, we learned that diary can be used with older adults in obtaining rich experience data among older adults in using mobile spiritual applications. 3E diary, for instance, manages to capture emotional and spiritual experiences of older adults in a structured way by writing and drawing user's emotional status. The used of 3E diary encouraged older adults to draw facial expressions to express emotional status compared to just writing in formal text. For example, in spiritual context, the user may draw crying face to communicate that they are sad, fear and repent as they feel the connection with God.

The use of diary is also seen as a suitable tool in capturing the spiritual type of data. In studying in the area of spirituality domain, it requires the researchers for studying in natural settings with the user use the apps at any time they prefer because spirituality is considered as owns privacy very intimate and could not be discussed in public. The diary is understood as something personal in nature, so the users often write diary in secret without even known by their respective spouses.

Spiritual applications or in other terms known as techno-spiritual apparently are closely connected to user's emotions and feelings. Results from this pilot study prevails user emotions while engaged with spiritual applications such as happiness, sadness, fear, repent, secured, calm and humble. There is also another issue raised by older adult's participants in the study, especially on the feelings of fear towards using technology, not confident and few others issue regarding ageing declines and generation gap in digital technology usage.

Lesson learned

Researchers have learned some important lesson from the study:

- Drawing techniques appear to be more effective for older adult user's especially to express facial expressions and their feelings. It is very useful to implement 3E diary in future study pertaining user experience evaluation in the context of mobile spiritual applications.
- Doing a study with older adults requires a lot of patience and perseverance. Since older adults encounter certain ageing declines such as cognitive, behavior and physical changes, thus, the researcher must always aware on how to tackle these issues.
- User experience evaluation is deemed important specifically for mobile spiritual applications for the use of older adults. There are a lot of things which requires HCI researcher's attention from the interaction, presentation, content as well as the functions of the mobile apps to tailor with older adults need.

CONCLUSIONS

The primary objective of this study was to evaluate the most workable diary design to capture spiritual experiences in using mobile spiritual apps among

older adults. The secondary objective was to investigate the needs of another method to complement diary study.

We suggest that, the use of 3E diary is workable with older adults, since the 3E diary appear to be as informal and natural tool in expressing older adults' emotions, feelings and experiences while using the apps. With some amendment on the 3E diary tool, it is believed that the tool will work better in future studies. Thus, the combination of diary and interview (pre and post interview) methods may strengthen the data gathering process. Interview method can be used to obtain clarification on drawing and text written in the diary so that to avoid any misinterpretation from the researchers side.

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