

# MAKING MEANING FROM CHILDREN'S DIARY DATA: THEMATIC ANALYSIS

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## ABSTRACT

Children today are different from children of the past. They move to a level which surprised the earlier generations. They are emerging as an active user of social networking sites (SNS) who influenced by different experiences that shape their perceptions and behavior. Thus, their current social behavior is the important aspects to be explored and investigate. Previous research was conducted to gain insights about children's behavior with SNS using probes diary. In this paper, we were making meaning of the diary data by thematic analysis, the most common qualitative technique in HCI. By using thematic analysis, we categorized and coded the data and identified the major themes among them. This analysis is supported by the ATLAS.ti software tool. The results show the main themes such as personal information, goals, social connection, social activities and social emotion. These themes were associated with significant contribution to explore the behavioral variables of child SNS behavior.

**Keywords:** *Probes, Diary, Thematic Analysis, Social Networking Sites (SNS) Behavior*

## 1. INTRODUCTION

Nowadays, the growth of social networking sites (SNS) shows a significant change in the social and personal behavior of the users. The growing popularity of SNS among the children users required an investigation of social behavior of young human beings. Exploring children's behaviors and experiences have been one of the core interests of the field of Child Computer Interaction (CCI) [1]. CCI is referred as the study of the activities, behaviors, concerns and abilities of children as they interact with computer technologies [2]. Therefore, children were the central focus of study since they are different and complex user population. By understanding children it tells us a new dimension of children's in digital world such as their needs, perception and new forms of sociability.

This research was an exploratory qualitative research conducted by the researcher on the basis of child personal experiences on SNS. The previous research was captured children activities and feelings relating to SNS by using a probes diary. A diary is used to record sequent series of children's routine and mood. In this paper, we were analyzing the data by making meaning the diary data using thematic analysis, the most common qualitative technique in HCI. Thematic analysis was used to derive themes

relevant to the topic of study. The results demonstrate the main themes emerged from the coding process which contributes to the behavioral variable of child SNS behavior.

## 2. BACKGROUND

### 2.1 Probes Diary Approach

The probes concept, largely credited to Gaver [3]. The probes used as a technique to "discover the unknown" [4]. The probe is used to discover new ways to leverage children's natural interests with hopefully return with useful or interesting data. The core of the probes approach is to give users tools to document, reflect on and express their thoughts on environments and actions. It also has proven as the suitable tool in qualitative research techniques in the context of private settings [5].

Probes have become an umbrella term covering everything from diary to user and field studies [6]. One of the most commonly used probes is a diary. The diary can be notebooks, booklets or electronic documents either with open or more structured questions where the participants are asked to record their feelings or activities during a certain period of time [7]. It is a medium for the participants to express the daily routine and their private life that

they can easily identify with. However, the success of diary approach was totally dependent on the participants' motivation.

## 2.2 Probes Diary Approach the Phases of Thematic Analysis

Thematic analysis is a method for identifying, analyzing and reporting patterns within data. It minimally organizes and describes the data set in rich and detail [8]. The thematic analysis method outlined in [8] consists of the following six phases:

Phase 1: familiarizing yourself with your data

Phase 2: generating initial codes

Phase 3: searching for themes

Phase 4: reviewing themes

Phase 5: defining and naming themes

Phase 6: producing the report

All phases are not a linear process. Instead, it is more recursive process, where the movement back

and forth is possible when needed, throughout the phases [8]. However, the phases of thematic analysis are similar to the phases of other qualitative research. The process starts when a researcher looks for meaning and issues of potential interest in the data. The endpoint is the reporting of the content and meaning of patterns (themes) in the data.

## 3. THE STUDY

### 3.1 Participants

We recruited seven children from 10-14 years old of school in Selangor. Two were male and the other five were females. We gather this potential child participant based on the purposive sampling, who is the experienced and active users of SNS. We obtain the consent from children and their parents to get involved in this voluntary study. The participant's basic information including their code, name, gender, age and the use of SNS is listed in Table 1.

Table-1. Participants Code, Gender, Age, Social Application And Devices

Participant code	Gender	Age/ School year	Social application	Devices
P1_F_10	Female	10 Year 4 Government school	-Instant messaging -Instagram	Mother's mobile phone
P2_F_10	Female	10 Year 4 Private school	-Youtube -Instagram	Sharing PC Mother's mobile phone
P3_F_11	Female	11 Year 5 Government school	-Instant messaging -Youtube	Own mobile phone Own tablet
P4_F_11	Female	11 Year 5 Government school	- Instant messaging -Instagram	Mother's mobile phone
P5_M_11	Male	11 Year 5 Government school	-Online Games, -Youtube -Facebook	Sharing PC
P6_F_12	Female	12 Year 6 Private school	-Instagram -Youtube -Twitter	Own mobile phone Own tablet
P7_M_14	Male	14 Form 2 Government school	-Online Games -Youtube	Own mobile phone

### 3.2 Our Probes Diary

Our diary is specially designed for children. It was a small size diary, similar to the size of children's exercise books which make it close to them [9]. The cover was the colorful handmade design with a variety of designs for both genders. It gives a sense of inspiration and motivation to

complete the diary as well as to get the children engaged. This child's diary was designed with playful activities to inspire participant such as coloring, drawing and sticker activities. A set of stickers was provided in communicating and interpreting the mood and feelings. This is a structured diary which makes easier for children to fill in immediately after an activity has ended. It was divided into four sections: Personal

Information, Routine, Feelings and Doodle of doodle.

### 3.3 Data Collection

We used the diary probes approach to collect qualitative data (Figure 1). The study was done during the school holiday where they capable to use SNS in maximum ways. In the first meeting session, we get to know each other by a short introduction to our purpose of the study, followed by the signing of the consent forms. In the next session, the probes diary was distributed to children and they were briefed in person. Participants are given a seven days to complete all the tasks.

During the self-documentation by children, we keep in touch by asking problem and remind them about the given task through instant messaging. The connection is important to support them throughout the process. It ensures the participants actively engaged and collect the required information.



Figure-1. Probes Diary

The completed diary was returned at the end of seven days. However, participants who requested more time were given an extra one week to complete their diary. At the end of the study, we are giving gifts and goodies as a reward and thank-you to the participants. A total of seven diaries were returned.

## 4. CODING USING THEMATIC ANALYSIS

Thematic analysis is implemented through the process of coding. Coding is the basic activity when

analyzing qualitative data. It is the process of identifying and organizing the data that are potentially useful for further analysis [10]. In practical terms, coding refers to the process of assigning categories, concepts, or “codes” to segments of information that are of interest to research objectives.

In analyzing the data, we combine both deductive and inductive approaches. Deductive approaches directed by existing concepts or ideas to analyze data. Meanwhile, an inductive approach directed by the content of the data. We start with deductive approaches as a structured diary was directed the codes. Along the way, the inductive approach is needed to compliment the coding process (open ended sections in diary). We used six phases of thematic steps as in [8]. Although these phases looked as sequential, typically it was back and forth process between different phases.

### 4.1 Using computer assisted qualitative data analysis software (CAQDAS)

The diary data was organized and analyzed using CAQDAS which facilitate a qualitative approach to qualitative data. It was capable to manage large volume of raw data to perform tasks in a quick and reliable manner. There are wide ranges of software in the market, but we choose ATLAS.ti because of the skills we have gained previously. We started the process by preparing the data for import in ATLAS.ti. The diary data was converted into digital image format. Then it was ready to import into a project in ATLAS.ti which is called *Hermeneutic unit (or HUs)*. *HU* editor is the main workspace in ATLAS.ti. *HU* consists of the workings, list of documents, codes and code references, memos and memo references [11]. The added diary was called *Primary Documents (or P-Docs)*. *P-Docs* refer to the data that we need to analyze. Here, seven *P-Docs* are added for seven participants. Figure 2 shows the *HU* editor with a *P-Doc*.

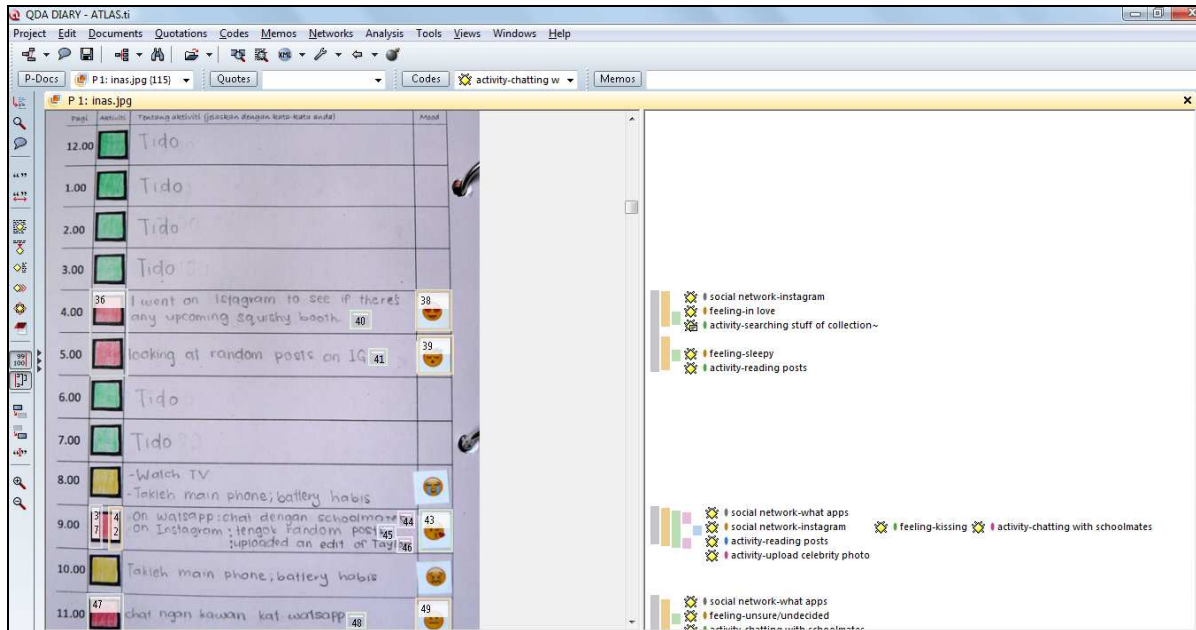


Figure-2. HU Editor With Loaded Primary Document

Once the diaries are added to an ATLAS.ti, the coding process is begun. The example of coding process can be seen in Figure 3. In phase 1, we started reviewing the materials. Here, were getting familiarize ourselves with texts and images in the P-Docs. We read through the entire data set repeatedly. After the reading and re-reading process, we summarized the data by memo writing or *memoing* a rich description/transcript. In ATLAS.ti, we create it in Memo. Then, we followed [12] to perform member checks by sending participants a copy of the researcher transcript to verify the accuracy of the content.

In phase 2, we were generating the early codes, codes and categories. In ATLAS.ti, a list of code is generated based on the research question which is to capture child SNS activities and feelings. Then, we highlight the corresponding data segment in the P-Docs and assign it with the existing codes (deductive codes). Basically, we coded each sentence in the diary with a phrase that captured the suitable meaning. The codes that do not fit into existing codes will form new codes. In ATLAS.ti, we create and assign new code (inductive approach). However, some of the existing codes being renamed a few times to better capture the meaning of the codes. By several times, we have a list of early codes. The different early codes (with similar meaning) were combined to form a code. Then, we continued the same steps to form a category.

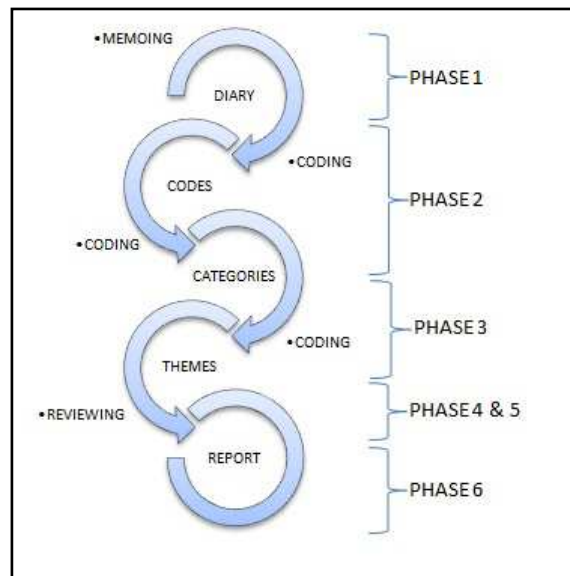


Figure-3. Coding Process

Phase 3 focuses on the broader level of themes. It involved sorting the different categories into potential themes. Here, we continued the coding process by revisit the categories until we get the final themes. We repeat the step of categorizing and interpreting until no new insight can be found to ensure data saturation.

In phase 4, we employed step to increase the trustworthiness of the study's findings. We conduct

a peer reviewing with colleagues and experienced researcher in brainstorming sessions. The purpose was to make the data validated by third party and reduce the element bias. Here, we get different ideas and interpretation of the code, categories and themes label. We were discussing and renaming those labels until we get the agreement on what suits them.

In phase 5, we defining and naming themes individually once the peer had evaluated the most common themes.

In phase 6, we produce a report. In ATLAS.ti, we create a network or graphical view. In a network view, we can visualize the complex information (codes, categories and themes) through the

relationship links. It is a smart way to visualize the analysis.

## 5. FINDINGS

From the diary data, 338 early codes from the coding process served as the starting point for the rest of analysis. From the early codes, we organize it into 146 codes. Then, the codes were organized and forming 24 categories. These categories then were refined into 8 themes. Initially, eight themes were developed from the analysis. However, five themes were the foremost themes acceptable to the topic of study. The example of early codes, codes, categories and themes were shown in Table 2.

Table-2. Example Of Coding Process Of Diary Data

Phases	Phase 2		Phase 3	Phase 4
Diary Section	Early codes	Codes	Categories	Themes
Section1	-Name -Birthdate -Siblings -Address -School -Mobile number -Email	About me	Personal Information Personal Trait	Personal Information
	-Born in other country -Fan of famous singer -Like catchy songs -Dishonest -Nerd	Facts about me		
Section2	-Achieve gred A result -Be pious -Successful in the world and hereafter -Study hard to achieve ambition -Shopping with friends -Makes parents proud -Makes whole family happy -Prove parents to be a good daughter and successful person	Personal goals	Goals Dreams	Goals
		Social goals		
Section3	-Instagram -Youtube -Online games -Tumblr -Twitter -Google -What apps -We chat	Social application Social platform Social technologies	Social networking sites (SNS)	Social application
	-Watching -Listening -Stalking -Shopping -Reading -Uploading -Searching -Playing -Chatting -Updating -Reporting	Online activities	Social activities	Social activities





Section4	-great -in love -naughty -wink -happy blush -kissing -ok -unsure -cool -grinning -determined -impatiently -bored -tears of joy -tired -irritated -need friends -sleepy -happy	Positive emotions Negative emotions	Emotions Feelings Moods	Social Emotions
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Here, children tend to share their unique personality or identity which makes them different from others. This is the most common childhood need with the focus on identity as one important theme [14]. The main value of having an identity was it largely benefit to their online social activities.

**6. DISCUSSION OF FINDINGS**

Seven child participants were used to draw the themes developed in this analysis. The foremost themes are described in detail as follows:

**6.1 Social evolution**

The first theme is social evolution in which children shows the advancement in SNS uses. Results of the study indicate that participant actively begin social networking at 10 years, being influenced by social trends and the nature of community. Being with social network is an integral part in their routines which in accordance with the definition of digital native [13]. The accessibility of technology at home made them an active user. However, the time spent was effected by degree of parental regulation. Most parents give some amount of freedom during school holidays and after school task completion. Most of the children were found to use SNS at any time to interact with the regular friends and satisfied their needs. They find it fastest and easiest to get on the social networking make them dependent on this technology.

**6.2 Personal Information**

A theme occurring across all the participants was their background of personal information. The entire participant specifically mentioned about their favorites, ‘interesting about me’, ‘facts about me’ and ‘my personality’. The participants expressed the interesting facts about them in quotes below:

- “I lived in UK mostly 5 years. In UK there is a lot of exciting stuff.” (P5\_M\_11)*
- “I’m interested in boxing” (P7\_M\_14)*
- “I love to make friend. I can easily make friends” (P4\_F\_11)*

**6.3 Goals**

The goal is another theme found in the data. Most of the participants have some clear goals to be achieved. Then, it was shaped into personal and social goal. Basically, their personal goal is to be a successful person. They want to be a smart student in school, a good son/daughter for families and achieve best results in education. Clearly, all children need to develop mastery in learning in order to carry this attitude with them throughout their life [14]. Their social goal was to create their parents happy which related to positive relationship with families, teacher and also friends. The need for mastery in learning and positive relationship reveals the agreement with [14].

**6.4 Social Application**

Social application is a theme represents a list of SNS. We choose ‘social application’ rather than ‘SNS’ (Table 2) as we agreed it carried the appropriate meaning for behavioral variable.

We found most of the children engaged in Social application. Instagram and YouTube was the most preferred SNS for various functions of social activities. We found that Instagram was the most preferred SNS for updating, uploading, searching photos. However, YouTube was used to enjoy watching and listening to music and movies. Basically, they are connected to both people and media content through SNS. This is clear that SNS provides an invaluable resource for fulfilling the basic human need for social connection [15].

### 6.5 Social activities

A social activity is the theme which represents child SNS activities. Social activities are a part of their daily routine. They do several tasks such as chatting, searching, reading, uploading, updating, reporting, stalking, shopping, watching, listening and playing. Socializing online (chatting, updating, read post) was rated as the most important online activity rather than browsing and watching/listening media content. This is associated with narcissism-promoting activities such as having as many SNS friends as possible, wanting their SNS friends to know what they were doing and other related activities [15]. A participant stated that:

*"I told where I was on vacation"*  
(P3\_F\_11)

However, these activities are made based on certain purpose to fulfill child needs. For example, a child who is the toy collector making use SNS to facilitate her desire. She went online to seek for information related to her hobbies:

*"I went on Instagram to see if there's any upcoming squishy booth"* (P6\_F\_12)

Another child was browsing to seek for the image idea in designing her room stated:

*"I'm looking for ideas to deco my rooms in Youtube"* (P4\_F\_11)

We found that children are always dependent on SNS for many activities. They also found of having greater comfort with the certain social application.

### 6.6 Social emotions

Social emotion is the theme represents the range of emotions. It was the result of the researcher's interpretation from SNS experiences and emoticons in the participant's diary. The shown emotion was relatively based on SNS activities they perform. SNS activities serve to meet the social-emotional needs of the children [15].

We identified a combination of positive and negative emotions were evoked through each participant's emoticon (in Table 2). The positive emotion comes from user satisfaction and engagement with SNS. The negative emotion is derived from emotional instability. The dependent on technology make they feel frustrated by its absence.

### 7. CONCLUSION

Based on our practice of thematic analysis in qualitative study to capture child SNS behavior with children, we conclude that thematic analysis (Phase 1-6) can be used in this research as a full method to form themes. By using ATLAS.ti, it supports a variety of analytical work in qualitative study. Thus, it simplifies the coding process without being loaded with manual tasks.

The contribution of this paper was in presenting a list of themes through the coding process. The qualitative themes were social evolution, personal information, goals, social connection, social activities and social emotion found to be the most common related to child SNS behavior. The themes that emerged in this study served as behavioral variables to create user profiling for future research.

However, it is important to point out the limitation of this study. Up to this stage, reliability and validity of data were a limitation to diary data. To ensure trustworthiness of this research, the reliability of the data needs to be increased by triangulation from other data sources or probes. The future work will analyze data from other probes. Indeed, the data from other probes will address more focused themes and gain deeper insight about the child SNS behavior.

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