An exploration of students' lived experiences of using smartphones in diverse learning contexts using a hermeneutic phenomenological approach

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Abstract

This study describes young people's experiences of using smartphones, by exploring what it means to acquire, possess, and create a purpose for these personal mobile devices within the complex and fluid contexts of formal and informal learning. Applying the principles and practices of hermeneutic phenomenology, this study's methods comprised the use of interviews and written reflective exercises. 12 youths ranging from 16-19 years old participated in 3 rounds of semi-structured interviews over a period of 6 months. The findings reveal that participants' smartphone appropriation is associated with self-identity and management of their image as it is perceived by salient others, including peers and teachers. Furthermore, the participants' smartphone use is dependent upon their perception of learning- value and subject to influences concerning the status of knowledge, from their peers, parents and the community at large. The findings would suggest that the significance that young people attach to this form of mobile device use and the transferability of such behaviours and uses across spaces, time and dimensions in learning contexts is critically a function of particular smartphone adoption at a cultural rather than pedagogic level. Further research including rich qualitative studies is suggested to better theorize the phenomenon of smartphone use in learning contexts through engaging with cultural and social perspectives.

Introduction

Over the last decade, smartphones have been adopted at an increasing rate amongst a growing demographic (Falaki, Mahajan, Kandula, Lymberopoulos, Govindan & Estrin, 2010; Soikkeli, Karikoski, & Hämmäinen, 2013). Smartphones differ from mobile phones with their comprehensive and relatively advanced features such as wi-fi connectivity high-resolution touch screen displays, web browsing capabilities, and sophisticated built-in applications. Furthermore, as smartphones run on mobile operating systems such as Google Android, Apple IOS, and Nokia symbian, they have the capacity to run numerous free and paid applications, transforming the once dedicated mobile phones into powerful, mobile personal computers (Ericsson, 2013; PC Magazine, 2013; Techopedia, 2014). With smartphones becoming increasingly more affordable, these devices have assumed increasing importance in people's everyday lives and their significance is seen in their use for learning, leisure activities, social interaction and identity formation (Madden, Lenhart, Duggan, Cortesi & Gasser, 2013; Pachler, Seipold & Bachmair, 2012, Stern, 2008).

In parallel with the increasingly rapid adoption of smartphones, there has been a growing emphasis on research that has both documented and explored the significance of mobile devices, including smartphones, to their use in learning contexts, and with salience to particular groups of individuals, such as youth in full time education, older generation lifelong learners, rural employees, and individuals unable to access campus-based education (see for example Cheung & Hew, 2009; Fanning, Mullen & McAuley, 2012; May & Hearn, 2005; Yen, Tang, Yen, Huang, Liu & Ko, 2009). But as may be expected with a phenomenon of such diverse and global interest and significance, mobile learning (m-learning) is an evolving concept, and consequently has a multiplicity of meanings, which arguably cloud a clear conceptual understanding of the contribution of mobiles to individuals' chosen use. For example, Paine Schofield, West & Taylor (2011) have defined m-learning as: 'handheld technologies, together with wireless and mobile phone networks, to facilitate, support, enhance and extend the reach of teaching and learning'

(p.2). However, other research has defined m-learning more specifically through its technical considerations, as in the work of for example El-Hussein & Cronje (2010), or in contrast, through attention to specific learner characteristics, as explored in the study of sub-cultures of mobile phone using adolescents by Walsh, White, Cox & Young (2011). Yet other research (Park, 2014) emphasises the sheer plethora of terms and contexts, simply arguing that m-learning is learning with mobile devices such as mobile phones, smartphones, Personal Digital Assistants (PDAs), iPods, PlayStations and tablets.

This lack of consensus has exposed two distinct occupations within the field, theorization of m-learning as a field of technological affordance distinct from e-learning (Traxler, 2010), and studies of m-learning's broadly defined educational relevance, diversely and situatedly conceptualised, as exemplified through the most ubiquitous and personalised type of mobile device, the smartphone.However, in terms of explorations of individual smartphone use amongst young people, and the resultant appropriation of the device's cultural leverage on learning and achievement, research is still extremely limited (Erstad, 2012; Pachler, Cook & Bachmair, 2010; Selwyn, 2012; Wallace, 2011). As Wu, Wu, Chen, Kao, Lin & Huang (2012) have demonstrated, not only is most mobile device-related research concerned with effectiveness and system design, it has almost been comprehensively approached through positivist methodologies, utilising interventions, surveys and experiments. In contast, this study adopts a phenomenological approach and thus aims to broaden the scope of research in this area.

1. Smartphones: expanding learning contexts or revealing learners' lives?

1.1 Why a study on smartphones?
There are several reasons for making smartphone use the central feature of this study. First, despite the realisation within current research of the significance of individuals' appropriation of these devices as a function of specific context, there has been a focus on the physical and technical affordances of mobile devices (portability, customisation and flexibility) and exploitation of these variables in classrooms to enhance teaching and learning rather than examine learner characteristics and learner preferences of mobile device (Chan, Roschelle, Hsi, Kinshuk, Sharples, Brown et al., 2006; Cochrane & Bateman, 2010; Sharples, Lonsdale, Meek, Rudman & Vavoula, 2007; Traxler, 2009). Resultantly, the technocentric, rather than the lived experiential perspective, currently dominates the literature, an issue that this paper seeks to re-balance through its contribution to the qualitative literature. Second, few studies carried out in schools and universities distinguish the unique pedagogical characteristics of smartphones as a clear subset of mobile devices (Traxler & Dearden, 2005; Winters, 2006) except through the lens of particular activities rather than device-centred possibilities. The work of Traxler (2009) and Cochrane & Bateman (2010) are notable examples of this latter area of inquiry. For example, there are many studies exploring teachers' adoption of smartphones for problem-based learning in primary science and mathematics classrooms (Looi, Seow, Zhang, So, Chen & Wong, 2011), and the field is replete with inquiries that seek to address problems of temporality, credentialism and access in higher and work-based education (Cook & Pachler, 2012; Coulby, Hennessey, Davies & Fuller, 2009). But in terms of starting with smartphone use as an issue of questioning the basic grammar of learning and teaching, studies are scarce: there is inadequate description and understanding of what individuals do with smartphones at a motivational and experiential level and as such, many pedagogical research analyses are impoverished in their cultural and social dimensions (Lee, Cho, Kim & No, 2014; Mothar, Hassan, Hassan & Osman, 2013).

Thirdly, whilst the exploration of mobility in social space has revealed a complex interplay of web-based and digital media applications that are associated with development of self-identities, self-

images, affiliations, personal agency and creative self-expression (Boyd & Ellison, 2007; Buckingham, 2008; Stern, 2008), conceptualization of how the cultural motivations for smartphone preference affect social adoption is under-theorized. Some findings show that youth are autonomous, self-directed and creative as they fashion their lifestyles based on "endless hybridization" or engage in a "remix culture", redolent of the highly contested term 'digital native' (Knobel & Lankshear, 2008; Lessig, 2008, Selwyn, 2009). Some of this literature suggests that youth are skilled in image manipulation, at both technical and philosophical levels, engaging in mutiple and fluid identity projects online and using the immediacy of smartphones to continually shape their public images (Stern, 2008; Wallace, 2011). Other research findings show however, that the majority of youth are engaged in more mundane activities with regard to the online use and adoption of digital media, using various applications routinely for school-based learning and research (Crook, 2012; Eynon & Malmberg, 2011, 2012; Luckin, Clark, Graber, Logan, Mee & Oliver, 2009). But it is in the leverage of mobile devices for social and psychological involvement, and particularly smartphones, with their multiple capabilities, that is the most complex and promising area of research (Wallace, 2011; Weber & Mitchell, 2008). As a result of these combined factors, there is a compelling need to investigate how smartphones are used by young people in diverse and everyday settings where learning is taking place.

1.2 Characterizing smartphone use in formal and informal learning contexts
The approaches that young people take in their learning are an important dimension in learning with smartphones. Marton & Säljö (1976a, b, 2005) suggest that when presented with similar learning opportunities, learners approach their learning in different ways. To investigate how learners conceptualized their learning, Säljö (1979) asked university students this fundamental question: 'What do you actually mean by learning?' He discovered five conceptions of learning and Marton et al. (1993) added a sixth conception of learning: learning brings a change to the learners themselves. The three conceptions of learning: learning as increasing of knowledge; learning as memorising; learning as applying facts and knowledge are considered by Marton et al. (1993) to be primary reproduction of information and engender surface approaches to learning. The other three conceptions: learning as involving change in a person, learning as understanding, and learning as perceiving something in a new light are believed to represent deep approaches to learning.

In the context of mobile technologies, Gee (2007, p. 172) believes that well-designed games can engender deep learning: learning that can produce "real understanding, the ability to apply one's knowledge and even to transform that knowledge for innovation." Lankshear & Knoble (2011) have argued that people's urge to engineer unique meaning and creativity for themselves has consequently extended the locus of mobile learning to settings outside the classroom: museums (Sharples, Taylor & Vavoula, 2007; Yatani, Onuma, Sugimoto & Kusunoki, 2004), field trips (Chen, Kao, Yu & Sheu, 2004; Stanton, O'Malley, Ng, Fraser & Benford, 2003), and use of educational games in a combination of settings (Facer, Joiner, Stanton, Reidz, Hullz & Kirk, 2004; Klopfer & Squire, 2008; Spikol & Milrad, 2008). However, whilst smartphones facilitate such migration to diverse learning spaces as well as the expansion of the learning sphere for individual users to an extent currently unparalled with other mobile devices, to date, there has been a paucity of research on smartphone learning in conceptual and temporal spaces that extend from formal learning institutions such as schools and universities and how and whether learners view these as pedagogical or social spaces (Looi, Seow, Zhang, So, Chen & Wong, 2010). Frequently, learning is visible and tangible, but as a result of its multidimensional and context-dependent nature, it is also often automatic, subconscious and undetectable (Gee, 2008; Pachler et al., 2010). Little is known for example of how learners on the move pack their learning into the gaps of everyday life, how learners' attention switch from one topic to another, how learners appropriate content from

peers (Stald, 2008), how hierarchies of what is learned are assembled in the interstices of time (Helsper & Eynon, 2013), and how such everyday learning accumulates over time (Merchant, 2012). This type of learning that occurs is often fragmentary, not immediately obvious or clearly delineated in the intermissions between activities. Our research addresses these conceptual gaps and thus makes an important contribution to the field of m-learning research.

1.3 Aims

The question forming the basis of this study is congruent with the nature of researching a largely intangible and invisible phenomenon, and which appears on the surface at least, to be ambitious and somewhat unstructured: the question articulates as 'What does it mean to learn with smartphones?' Since this question comprises various embedded and overlapping phenomena, which required further exploration, the following three sub-questions were examined:

- For these participants, what are the lived experiences of learning with smartphones?
- What are the participants' perceptions of their learning with smartphones?
- How is the learning related to participants' identity formation, identity management and presentation of self?

2. The study context and design

2.1 Malaysian youth and smartphones: a critical context

This study takes as its subject the everyday smartphone practices and learning lifeworlds of a group of youths at secondary schools and colleges of higher education in Malaysia. This context is extremely significant since the Malaysian government has been promoting the utilisation of communication and mobile technologies over the last five years (Mohammad & Woollard, 2010) and launched a strategy to integrate mobile devices into classrooms at every stage of education (Tan, 2012). For example, under the fiscal budget for 2013, Malaysian youth were entitled to a rm200 rebate to purchase a 3G smartphone (The Star, 2012). The Malaysian Ministry of Education's attempt to introduce mobile devices into the classroom during 2013, was however, met with opposition from some educators, parents and students alike, for reasons of concern surrounding maintenance of educational standards and envisaged disruption to the educational environment. As a result, it has had to defer this policy (The Straits Times, 2012). Thus, the study of the lived experience of Malaysian student participants learning with smartphones will prove useful especially in its implications for learning in formal and informal contexts, and especially in other international settings of policy development and change in relation to mobile device integration and implementation.

To date, most of the research in the area of mobile device in the context of Malaysian Education has focused on the proliferation of mobile devices amongst users, and analyses of demographics and usage profiles and particularly in higher education (Song, Murphy & Farley, 2013). Embi & Nordin (2013) point out though that although mobile learning research in Malaysia has increased over the last 5 years, the actual deployment of mobile learning in higher education for example has not kept pace, for reasons of affordability and differential adoption by older university teachers as compared with younger university students. Furthernore, reasons of economics are significant: although student use of smartphones has changed drastically over the last five years, usage by students at private institutions in Malaysia significantly exceeds that of public university students particularly in pedagogic contexts (Salam, Hameed & Bakar, 2013). However, as both Lim, Abas & Fadzil (2011) and Hamat, Embi & Hassan (2013) have pointed out, surveying the mobile learning landscape is only the beginning in developing an understanding of how devices are used within the student learning experience: what is required is a rich and intimate

description of the mobile and smartphone habits of Malaysian students in both compulsory and non-compulsory, as well as national and private education contexts. This paper addresses these issues, having participants in all these groups, and this makes an important contribution to the field.

Despite the clear rationale for our research however, in methodological terms, there are complications for mobile learning research on everyday mobile practices due to the fragmentary and 'taken-for-grantedness' inherent of this type of learning (Pachler et al., 2012). Research of informal and mobile learning are often centred on the learners' own perspectives and metacognitive analyses of their learning, through reflective accounts, surveys, semi-structured interviews, and diary studies. Limitations arise with these types of retrospective accounts of learning as learners may have issues with accuracy of recall or rationalisation of some of their actions or thought. Thus, the choice of the research methodology, method, analysis and interpretation are of fundamental importance in this study.

2.2 Hermeneutic Phenomenology: philosophical underpinnings
A hermeneutic phenomenological design was used in this study as it represented the optimal way to investigate a complex phenomenon that was difficult to capture given its fragmentary and "taken-for-granted" nature. Hermeneutic phenomenology is able to uncover the uniqueness of individuals' experiences with an emphasis on the individuals' historicality or background (Gadamer, 1997; Heidegger, 1962). To date, there appears to be no hermeneutic phenomenological research in this area. Utilising the theoretical principles and practices of hermeneutic phenomenology, this study aimed to gain access to a phenomenon that is often subconscious in order to understand the nature and meaning of the participants' lived experiences.

The conceptual and knowledge gaps from the literature suggested a need for more qualitative studies as a sufficiently rich picture of m-learning, particularly one in its naturalistic settings would require research from across different paradigms. Of all the qualitative methodologies, hermeneutic phenomenology is the most appropriate methodology for the investigation of everyday mobile practices as it is uniquely suited to study the essential meanings of lived experiences (Gadamer, 1997; Heidegger, 1962; van Manen, 1990). Phenomenology comprises its own "philosophical and theoretical approach premised on a phenomenological concept of experience as well as a research methodology consistent with this theoretical framework" (Cilesiz, 2011, p. 493). It is the inquiry of experience with its meanings. Hermeneutics enhances the interpretive element to illuminate assumptions and meanings in the text that participants themselves may have trouble expressing (Crotty, 1998; van Manen, 1990).

The lived experience in its most fundamental form concerns a pre-reflective, immediate consciousness of life and it forms "part of a system of contextually related experiences, explicated from it through a process of reflection on its meaning" (van Manen, 1990, p. 37). Lived experience has a temporal structure in that its immediate appearance can never be grasped; it is only as past presence that its vividness and entirety can be fully understood. The focus of this study is on the lived experience of students learning with smartphones, that is, the content of pre-reflective, immediate consciousness of using their smartphones for learning, the manner of the experience, and the subsequent reflection and interpretation of this lived experience.

Gadamer (1997) proposed that understanding of the world was through language and, more specifically, speech and conversation that were central to all interpretive understanding. Language and communication are entwined and hermeneutics present a way of understanding

the human experience that has been captured in context and through language (Gadamer, 1997, van Manen, 1990). This is one drawback of the research approach as obviously all existence cannot be reduced to language and, therefore, the way to 'being-in-the-world' (Heidegger, 1962; Gadamer, 1997)) through language is only ever limited. The basis that all understanding is interpretation and interpretation can alter over time means that any assertions made can only ever be tentative and conditional. Critics are uncomfortable with this premise on the lack of universality, or fixed immutable properties to human phenomenon (Finlay, 2012).

Hermeneutic phenomenology is an exercise in subjectivity and inter-subjectivity, and hence, has been open to criticisms of a lack of rigour (Sandelowski, 1986). Existential phenomenologists like Heidegger and Merleau-Ponty believe that researchers can never truly bracket off all their presuppositions and as Merleau-Ponty (1962) declares, attain a 'God's eye view' of the lifeworld and lived experience. Finlay (2009, p. 12) argues that "researchers need to bring a "critical self-awareness of their own subjectivity, vested interests, predilections and assumptions and to be conscious of how these might impact on the research process and findings." As such, researchers' subjectivity should be foregrounded to separate what belongs to the researcher and the researched. The researcher's self-reflection comprises a vital step of the research process, and presuppositions and preconceived biases need to be brought into awareness to separate them out from participants' descriptions (Colaizzi, 1973). Gadamer's (1997) 'phenomenological attitude' that is, the adoption of an attitude of openness and critical self-reflection were practised in the design and conduct of this research study.

3. This Study

3.1 Sampling and selection of participants
In accordance with the interpretive research paradigm, and in line with the need to explore participants experiencing the 'phenomenon' under inquiry, purposive sampling strategies were used to select the participants (Denzin & Lincoln, 2000). The 12 students chosen were 16-19 years in secondary schools and tertiary colleges, and national and private institutions. There was a range of students from different educational backgrounds as Malaysian secondary schools presently bans the bringing of smartphones to schools, while private tertiary colleges generally allows their use in classrooms. There would be thus, a diversity of learning experiences in formal and informal settings. The other criteria for the sampling were based on race, gender (7 males, 5 females) and at least one year of experience with using smartphones. The profiles of the students who took part in the study are shown in Table 1 below. Issues of generalisability and representation are central concerns in all research studies, but the generalisational qualities of phenomenological research apply in a particular way that is commonly criticized in studies of phenomena, that on the surface seem to be occupied with small samples and individual's unique and idiosyncratic lives (Giorgi, 2008). On the contrary, phenomenological studies, whilst not aiming to represent at the level of populations, are occupied with the distillation of issues that can be generalised to groups of people: as Solomon (1972) points out, "the phenomenological reduction… guarantees that we see essences and not just individuals" (p. 22). Equally, the representational qualities of phenomenology are equally critical, and the methodology and methods adopted do not seek to describe supposed 'objective truths' that represent every possible variation of a phenomenon's impact, more more accurately, faithfully and carefully expose every nuance of the lived experience, so that all data - whether interviews, testimonies, gathered, become minutely to represent a phenomenon in all its richness and diversity.

TABLE 1 INSERTED HERE

To meet the aim of an in-depth investigation, there were 3 rounds of structured interviews with 12 individuals. Interviews were conducted over a period of 6 months until the point of saturation where no new ideas were surfacing. Each interview was recorded and transcribed verbatim. Permission for the interviews and recordings was sought from the participants and their parents, and transcripts and interpretations were made available to them to comment. This ensures accuracy of data analysis and interpretation to achieve better methodological rigour. The researcher was careful to maintain "hermeneutic alertness" (van Manen, 1990), which is the reflexivity required to reflect on situations and stories rather than accepting them at face value or imbuing them with pre-conceived suppositions. Field notes that were written down after the interviews were instrumental in recording the researchers' insights and reflections and a critical examination of the emerging issues.

3.2 Data analysis and Interpretation

As this was an interpretive hermeneutic phenomenological study, the analysis and interpretation of the interviews were guided by van Manen's (1990) methodical procedures. First, interview transcripts were read carefully and repeatedly for emerging themes: detailed reading at sentence or cluster level, then using the selective or highlighting approach and finally reading holistically. These themes were:

- Difference
- Value
- Me, Myself, I, and
- Influence

Second, as the researchers dialogued with the texts, themes and sub-themes emerged, and a coding frame was developed from the key words and concepts (van Manen, 1990). Third, interpretation of the themes and sub-themes was achieved through Gadamer's (1997) hermeneutic circle and the fusion of horizons. The hermeneutic circle refers to the interpretive process that moves from components of experience to the whole experience and back again and is repeated to enhance the depth of understanding and engagement with texts. The researchers' prejudices and presuppositions are acknowledged and considered as valuable in hermeneutic phenomenological research. In Gadamer's conceptualization, one horizon is the researchers' prejudice and the other is the subject on hand. The aim is for a fusion of horizons as the researcher dialogues with the texts to bring about understanding of the research phenomenon under inquiry (Gadamer, 1997). In this study, the researchers examined their prejudices in the field notes and continued with the examination in the analysis stage.

4. Findings

As participants' lived experiences had been shaped by the socio-cultural and technological contexts in which they were enacted, the essential meanings derived from the findings show a complex interplay of patterns of use, motivation and influences. 4 major themes ('Difference', 'Value', 'Influences' and 'Me, Myself, I') emerged in this study and they are presented in Figure 1. No one theme or its sub-themes are able to adequately represent the meaning of learning with smartphones due to their overlapping and interdependent nature. The meaning of learning with smartphones thus, is a multifaceted composition of all the 4 themes.

FIGURE 1 INSERTED HERE

Theme 1: Difference

As young people are intensely engaging with their smartphones every day, learning occurs as it is interwoven with these mobile practices. These new types of learning may be strikingly different from traditional classroom learning but they are arguably invaluable in enabling learners to navigate the structures and meanings of the online world and transposing such skills and knowledge into their 'real' worlds'.

Two types of learning practices emerge from the participants' lived experiences: *serendipitous and purposive learning* (Table 1). They exist on a continuum of smartphone use shaped by temporality and intentionality. Serendipitous learning is usually unplanned and spontaneous occurrences embedded in everyday mobile practices and are of short durations. Serendipitous learning embraces fiddling around with mobile applications and stumbling upon topics or information especially when participants are bored. It includes learning incidentally, when participants were playing games or social networking. Some participants see it as 'learning on the go', 'spontaneous learning', or 'learning on the spot' as can be seen from Andy's quotes below.

> I wake up, check my phone. Check messages. Normally after checking messages, if I'm bored, I'll start going the apps. From then on, I'll just fiddle around lah…. Er…I'll look through and suddenly I may see an article about something, so I'll just read. From then on, I may go deeper, and jump to the next topic.

Purposive learning is of longer durations (30 minutes to 4 hours per day) and includes using smartphones to search for information to do homework or projects, exploring hobbies or communicating with others in communities of practice (Table 2). Both types of learning can occur in formal and informal learning contexts as the older participants have used their smartphones in their classrooms. Participants derived satisfaction, enjoyment and empowerment from serendipitous and purposive learning.

TABLE 2 INSERTED HERE

Participants used surface approaches (Marton & Säljö, 1976, 2005) for serendipitous learning as their engagement with texts and tasks tended to be superficial and exploratory. Deep approaches to learning are displayed in participants' purposive and intense engagement with topics of interest, hobbies and games. Some participants deliberately chose games to play during their leisure with the intention of improving their critical thinking, time management and planning skills. One participant, Eng played the game, *Sudoku* on his smartphone with the intention of training himself for his future undergraduate course in Engineering:

> Because engineering needs to think fast, cannot finish the work slowly. ….*Sudoku* is logic…your brain has to perform very fast, I think it's the same frequency as engineering. How fast you think in Engineering.

In reading e-books and learning languages, participants' intention to derive benefits from digital technologies and their smart devices was evident. The outcome of this deep learning was a change in their world views, mindsets and attitudes to the topics and subjects they were intensely engaged in as Bloggergirl explained:

Actually, I'm not sure how to describe it but it's the fact that once you learn something new, then it becomes a part of your general knowledge and you look at life a bit differently because you know that thing exists.

Participants moved fluidly and easily between serendipitous and purposive learning in their daily practices suggesting a continuum of use rather than marked by strong boundaries between the two approaches. Their personal learning from online sources of information could be easily transposed into their 'real worlds', for example, after learning basketball tips or baking cupcakes from *YouTube* videos, they implemented the knowledge and practised the skills, and in the process, received immediate feedback from friends or families. They would return to their online world for more tips or information if they had limited success with their efforts. There appears to be an easy movement from learning from virtual worlds to testing and practising the learning in everyday worlds.

Theme 2: Value
While valuing the smartphone for its benefits, some participants possessed a nuanced view regarding its significance. The learning with a smartphone was compared to a "double edged sword" or a "Pandora's Box". Like a Pandora's Box, the wonders of the Internet may be manifold, positive and harmful at the same time. All participants did not totally trust the information or the people they befriended on the Internet, stressing understanding and interrogation of information rather than simple acqisition or memorization:

> Because the Internet is still not fully trustable, people can tell lies, you know people can turn the stories here and there, like politics and stuff like that. (Andy)

Other negative implications of learning online with their smartphones include observations on the seedier side or the underbelly of the Internet which could harm trusting users, and a realization of the silencing of their views in which they simultaneoulsly coveted and mistrusted mobile use in classroom settings:

> We want to say yes as we all want to bring our phones to school but in a debate, we'll say no. It does more wrong. Let's say in a boys' school, won't they use in pornography?   (Stevie)

Participants generally expressed indignation over parents' and other adults' assumptions of the lack of learning in their everyday mobile practices. In their accounts, they emphasized that their learning: explicit and subconscious learning were occurring at extended periods, at a breadth and depth that many might not perceive or understand as seen in Stevie's quotation below:

> We do read. Older generations tend to think if we're holding our phones, it means we're texting, we're not reading. What they don't know is that we might be reading through our smartphones. Just because you don't see it, doesn't mean that we don't (laughs)………(Reading estimate) I think it's a lot! I don't do it all at once but it accumulates…… Per day...3-4 hours…..Ya, ya! Cause we're unaware, we just take it, put it back, take it up again. (Stevie)

More importantly, participants cited some evidence of increased knowledge, greater vocabulary building, better English Language skills and better academic results as outcomes of learning with their smartphones. In one particular case, the parents of one participant used his smartphone reading habits and good academic results to encourage his younger sister to start reading on a

new smartphone that they had bought for that purpose. Learning with smartphones may be distinctively different from academic learning as it is highly subjective, personalized and at times, mainly to parents and some teachers, seemingly haphazard and fragmented in its context:

> When I am playing the piano, I put my smartphone in front, because I may forget the chords, so I put the phone in front of me with the chords displayed on it and I play the piano while looking at it. Like performances. (Stevie)

However, if learners perceive and believe that learning has value and worth, and this learning aids them in the fulfilment of their learning and life goals, then the learning is significant and important. The whole of the learning with smartphones, therefore, is arguably greater than its parts.

Theme 3: Me, Myself, I
Smartphones were used by the participants to document their personal lives and share photographs, and videos with their friends and increasingly an international audience on websites such as *Facebook, YouTube* and *Instagram*. These photographs and videos of their everyday lives are essentially representations of their selves and by sharing these with their communities and strangers, they afford these artefacts a certain significance, permanence and status (Pachler et al., 2010). Photographs and videos, embodiments of personal histories, thus functioned as sources of discussion, reflection and analysis among their friends. In addition, these artefacts created by the participants enable them to have different self-images and documentary histories of their lives which in turn contribute to the formation of multiple identities. Specifically, different identities were developed and presented online in their favourite personal communities such as *Facebook* and *Twitter,* but with different purposes, as Stevie points out:

> …you can go to a person's *Facebook* page, and *Twitter* page, and you can find that on *Twitter* they post things like, "I am facing depression". *Facebook* is how you want people to see you. *Twitter* is who you really are....because *Facebook* is too public, errm there is also the question of '*face*', on *Facebook* there is the unconscious part where we don't want people to judge us, and in *Twitter* it's more like a personal group.

Furthemore, in an effort to impress or influence others, 'impression management' was practised with a different 'face' in *Facebook* and yet another in *Twitter*. *Facebook* is considered as an 'open book to their lives' and hence, participants put their best 'face' forward as they wanted to impress members of their communities. *Twitter* has a smaller group of followers and would usually comprise of the most intimate friends. Hence, participants were more frank in their writing and sharing, most probably sharing more of their most personal thoughts and actions.

Personal agency, which is the desire to exert control over how and what young people learn with their smartphones, is most likely associated with their sense of selves and the youthful aspiration to show independence from their parents and teachers. Participants in this study enjoyed a strong sense of autonomy as they were in control of their own learning. Many of them claimed that their learning practices were decided by themselves and their experience learnt through self-exploration and experimentation. Zerros, one of the participants explains:

> I influenced myself…. I use my smartphone like that lah because I plan it. If I decide it's good for me, then I'll use it... Like the application for the cooking. Is it useful for me? Like in the cooking application, I can apply the measurements, I can apply the terms for the

cooking. I don't know what's the terms so I just go, open my app, search for the term and something like that.

As participants have personal ownership and autonomy over their smart devices, they develop close relationships to these phones. Participants experience an intense dependency on their smartphones, describing them as 'friends', 'best buddy', 'companion' and 'wife'. The close relationships to their smart devices are exhibited through actual physical contact with smartphones usually in their hands, in their pockets. Smartphones become more than the tools with which they view and experience the world, and negotiate and construct meanings. The use of people metaphors to describe their smartphones suggests the great importance the smartphones have become in their lives.

Theme 4: Influence
The extent of learning with smartphones and its value is influenced by learners' friends, families, teachers and the community. Parents' influence is limited, as they generally do not understand the potential of the smartphone for learning. However, familial influence did seem to be strong in terms of very particular uses, rather than in modelling general behaviours: in one case, a participant's mother actively encouraged her daughter to read online newspapers by modelling her smartphone reading for her daughter, and in another case, an uncle compared prices to manage his accounts better:

> Umm..like learning. One of my uncles, he…usually uses a smartphone. For him,   he likes to go on vacations, he checks on pricing on tours, holidays…. He'll say like "Use phone to check out things. It's more better." Because he says it's easier and to make full use of today's technology. (AJ)

Other sources of influence were family members like elder siblings and participants' friends who were adept with using smartphones for learning in informal and formal settings. One participant, Deeptzer, relied strongly on the number of 'likes' she received on her Facebook page, to tell her whether his photography artistry and skill were improving:

> Erm…. some of it…. most of them just like the picture, they actually do the 'like'. Few of my friends who are interested in photography, they tend to comment   on; sometimes they know how to take it from a certain angle, they just explain to you. Umm…. you could also take it from this angle and you could have a beautiful picture. Through that, you also get to learn.

Friends were usually instrumental in their choices of mobile applications, brands of smartphones and in some cases, reading and writing habits. The media can be a source of influence as advertisements and informative articles on the use of smartphones, its learning potential and mobile applications could influence learners in the way they use their smartphones for learning. The value the community places on learning with smart devices may be a significant influence on learners' perceptions. Participants' patterns of use and motivations are affected by the complex interplay of friends', parents', teachers' and media influences. Beyond these patterns, there are emergent practices that showed participants' use of their smart devices and digital technologies to support academic learning in new and innovative ways. There were new patterns of study group behaviour using *Skype, Facebook* and *What's App* as in the quote below:

> Err.. normally at night, the phone is just besides us and we on Skype. Friends call me at night on *Skype* and all our friends are around and the *Skype* is on. So er.. so if there is no

problem, we'll be quiet lah, but if there's a problem, then we..we'll be like ask our friends. Then if anybody knows, they'll try to help us out… No, you can actually hear the flipping of pages (All laugh). *(Eunice)*

Bridging a gap between trust, confirmation, and social learning, teachers were regarded strongly as an influence within participants' smartphone usage, in a variety of ways, the implication being that teachers still play important roles in the students' learning, although their roles are changing:

> Yeah, the knowledge from the web, yes, you don't believe it, you can't take it for granted, so the teacher is the last line of defence, to get to the truth…like   why would they lie, so yes, that's the final word. (Deeptzer)

> I see a new term and I'll look for it online. Internet cannot be fully trusted, so I'll look up a few websites and see what they…how they explain it. After that, I'll…okay maybe I've learnt something new. Then I go to my teacher and I'll   explain it to her and if she agrees with it, then I've learnt something new. I feel happy that… Just to confirm the point. (Andy)

Overall Conclusions

The aim of this study was to investigate the question, 'What does it mean to learn with smartphones?' using a hermeneutic phenomenological design. The picture of learning with smartphones that emerges is one of multiple aspects, complexity, and fluidity. These personalized types of serendipitous and purposive learning may be different from the culturally accepted forms of formal learning but they are not inferior. They have value and significance as they assist in the development of multiple areas of learning - reading, writing and listening skills – and in which social use and personal preference seem to be as much a part of the cultural nature of learning as much as the primarily pedagogic strcuture of formal education contexts, a finding from this study and elsewhere (Madden et al, 2013; Merchant, 2012; Pachler et al., 2010). The patterns of use and motivations for learning are influenced by their friends, families and parents and given the participants' dependency and their close relationships to these smart devices, the lived experiences of these participants are highly subjective and relative. This is an important finding especially bearing in mind the current investment in research agendas in mobile technology that appears dually focused on particular activities and curriculum innovation (Mothar et al, 2013; Salam et al, 2013). It is particularly significant given the international context in which the study was carried out: in Malaysia, investigating applications of mobile technologies is at a critical stage given the almost universal usage of such devices in particular cultural and economic groups, but further migration of mobile learning is dependent upon detailed knowledge about the preferences of users, and this is still at an early stage in relation to particular groups, including those attending public education institutions for example.

At the level of engendering learning through the design and modification of personalised learning applications, this study suggested strongly that there was communication between people and other people with technology and technolohical know-how, (Pachler et al., 2010; Weber & MItchell, 2008), and appropriation of knowledge through individual foraging, with typically short bursts of knowledge gathering and knowledge generation activities (Cochrane & Bateman, 2010). Such learning as took place, was consciously deep or surface (Marton et al, 1993) but it was crucially, often a relationship or a personal encounter that precipitated an extension of learning from one context to another, contrasting with Lankshear & Knoble's (2011) argument of learning context shift as a personal urge. In emphasis, the mobile practices of the participants in this study, whilst rich and varied, being concerned with the pursuit of inquiry, creative expression,

collaboration, production and publishing, were underpinned repeatedly by the notion of 'audience' and 'community' (Crook, 2012; Eynon & Malmberg, 2012; Luckin et al., 2009; Stern, 2008) and participation in communities of practice with people who share their goals, interests and activities (Lave & Wenger, 1991).

Most research literature reveals generally positive outcomes and attitudes to m-learning (Madden et al., 2013; Wu et al., 2012). In this study, there is a more nuanced view of the learning: it empowers and satisfies but it can be a "double edged" sword. This nuanced perspective of the value of their learning is new as participants view smartphones as engendering both increasing and diminishing returns. Participants placed a high premium on the advantages of appropriation, creation and publishing of knowledge resources at the pace, convenience, and accessibility that smartphones could afford, and in common with Helsper & Eynon's (2013) work, found productivity and creativity as an interstitial, rather than primal, activity. Buckingham (2008, p. 17) suggests 'in learning with and through these media, young people are also learning how to learn" and developing particular orientations toward information, particular methods of acquiring new knowledge and skills, and a sense of their own identities as learners.' Participants' development of their self-identities was in part aided by their mobile learning practices. Through foraging for knowledge, experimentation and dialogue with peers and mentors, participants' identities evolved and changed constantly in what Weber & Mitchell (2008, p. 43) suggest is a 'work-in-progress, an evolving active construction that constantly sheds bits and adds bits, changing through dialectical interactions with the digital and non-digital world.'

The current debate on the implementation of m-learning in academic institutions focuses on the nature and fit of the technology to educational settings (Crook, 2012; Merchant, 2012). Recommendations have been made for the identification of mobile/social media practices for adaptation and accommodation into the structures of formal educational practices (Coulby et al., 2009; Merchant, 2012). However, tensions exist between youths' preference for multimodal forms of expression and learning, and the cultural bias towards representational forms of production and expression in academic settings (Crook, 2012). Some researchers (Erstad, 2012; Selwyn, 2009) have questioned the value of such informal learning, with its fragmented assemblies, narrative structures, consumption emphasis and subjectivity. Furthermore, because learners in this study viewed understanding and knowledge building as a peripheral – albeit important – activity, learners often appeared confused as to the nature and significance of what they were learning, a finding supported by the work of Looi et al, 2010. This is exemplified in the issue of the status of knowledge: participants in this study asserted that learning with mobile applications and the mobile Internet was comparatively better than learning from a teacher or a friend as the individual persons have finite knowledge while the knowledge in the Internet is limitless; however, such reliance is not without limits – participants may have utilised the extent of the web but for absolute comparative purposes and validation of their ideas or others', teachers, peers and family were the ultimate arbiters, a finding seen in the work of Wallace (2011) and Stern (2008).

The participants in this study viewed the value of their smartphones as devices to help them in their studies, careers and, to make friends and contacts (building of social capital) are confirming their acceptance of the dominant, subliminal message sent out by these smart devices, and a congruence with Clough et al. (2008): smartphones improve productivity, efficiency, choices and unparalleled access. However, Merchant (2012) argues that if modes of accessing, sharing and building knowledge question the status of knowledge, and expose the increasing disparity between how learners and educational leaders conceptualise learning and knowledge prodiction, then educational institutions need to pay close and critical attention to everyday mobile practices

to determine if these practices can be re-imagined as legitimate educational practices in their distinctive institutional settings. At present, it is not clear that such a process is happening in a planned and systematic manner (Song et al, 2013). The wider implications of this are clear in this study's context and others - they demonstrate how important it is to examine how these devices are used in everyday practices and their relationship to learning: developing new theorisations from the lifeworlds of children and young people from research such as ours, would enable policy makers and practitioners to develop more well-informed polices and strategies to enhance teaching and learning. Furthermore, understanding the relationship between leverage of devices and social and economic mobility is fundamental to preparing students for further study and employment.

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