# Conclusion

In this ever-changing world, the only unchanged thing is to change constantly. It is specially so in this mobile world, where everything and everyone are wirelessly wired. With mobile technological advances being constantly introduced, mobile is ever changing its use and corresponding experience as different uses of mobile will naturally result in different mobile experiences. When mobile was first introduced, it was used for making phone calls only. Soon after that, with new features and functions being introduced, it was used for texting, taking photos, and video recording. With the advent of smartphone features, functions, and social media, mobile has become even more powerful and popular than ever, becoming the most popular and powerful medium in the world.

Equipped with ever changing features and functions, mobile enables users to produce, provide, advertise, market, sell, or consume content anytime anywhere, be it a love story, a poem, a bottle of wine, a brand, an image, a video, an audio, or a multimedia product. Interactive, integrated and immersive, mobile also enables users to experience a content, product or service in a media-rich environment for any purpose, ranging from governing to shopping. Across time and space, mobile has been widely used in different areas, including mobile journalism, mobile advertising, mobile marketing, mobile public relations, mobile social communications, mobile dating, mobile parenting, mobile government, mobile health, mobile learning, mobile banking, mobile shopping, mobile commerce, mobile entertainment, mobile creativity, and mobile business.

Both mobile use and mobile experience have been widely examined, leading to increasingly accumulated body of knowledge. Previous studies, however, have largely focused their investigations in country-specific mobile use and experience in different areas. Few studies have been conducted in a comparative fashion to compare mobile use and experience in different countries. Another need for comparison is that fact that previous studies have been published differently in different languages, there has also emerged a pressing need for different language comparative studies. Through comparative studies, we will be able to locate similarities and differences at both the macro and the micro levels. Furthermore, we can also identify similarities and differences at the normative and the empirical levels as well as the gap between two.

Since different countries around the world have become so interdependent and interconnected in so many ways, whatever we share or differ in will affect our interaction with each other in the mobile space, where any event or issue in one place will affect those in other places in one way or another across time and space, generating ripple implications socially, culturally, economically, and politically (Xu, 2018). To achieve a holistic picture and a better understanding of the mobile world, it is necessary to conduct a comparative investigation of mobile use and experience in different communities, countries or cultures to enhance our global mobile communication literacy and competence (Xu, 2018).

The essence of comparative studies is to validate, revise, triangulate, and glocalize research results, as explained fully by the authors The Handbook of Comparative Communication Research in the following: (1) to validate or revise country-specific interpretations, (2) to avoid country-specific overgeneralizations, (3) to challenge country-specific paradigms, (4) to contextualize country-specific understanding, (5) to establish global scholarship, and (6) to obtain locally-applicable knowledge and experience (Esser & Hanitzsch, 2012, pp. 4-5).

Being interdisciplinary, comparative and applied, dimensions and directions of further studies of mobile use and experience may be guided by the most important questions identified by scholars include (a) how humans interact via mobile devices and the consequent implications (suggested by James E. Katz), (b) how to theorize mobile media and communication, (proposed by Harmeet Sawhney), and (c) the nature of mobile media and communication (suggested by Michele H. Jackson) (Craig, 2007).

Guided by these central themes and following a comparative approach, it is recommended that focuses should be placed on comparing mobile use and experience in different areas in different countries in the presence of a basis for comparison. Furthermore, a 3M framework was proposed to use, that is, to map, to measure and to model. To map is to locate where different components of mobile use and experience are located. To measure is to gauge different levels of different components of mobile use and experience. To model is to describe, explain and predict a pattern in mobile use and experience respectively (Xu, 2018).

In terms of research methods, further studies of mobile use and experience should involve a mix of different research methods. For instance, it may be more accurate and reliable to use a mix of surveys, focus groups, in-depth interviews, content analysis and/or experiments in comparing similarities and differences in mobile use and experience around the world in order to provide more accurate and reliable findings through triangulating and or complementing the results of studies using different research methods.

## FURTHER STUDIES OF MOBILE USE: DIMENSIONS AND DIRECTIONS

Mobile use has been examined in terms of its informational, relational (Lee, Kwak, Campbell, & Ling, 2014), extractive, or immersive use (Humphreys, Von Pape & Karnowski, 2013). It has also been investigated in terms of different demographic features, resulting in differences in age group, gender, physical conditions, or occupation (e.g., Ventola, 2014; Organista-Sandoval & Serrano-Santoyo, 2014; Brandenburg, Worrall, Rodriguez & Copland, 2013; Hashim, Tan & Rashid, 2015; Lee & Kim, 2014).

Further studies of mobile use and its impacts should also include the following areas: (a) mobile forms, (b) mobile formats, (c) mobile features, and (d) mobile functions, which are closely related to mobile use and its impacts on actors and activities. They can also be investigated and compared by using the 3M approach using mixed method research. For illustration, the following paragraphs investigate mobile features:

### Further Studies of Mobile Features

Mobile features, by definition, refer to those features that mobile devices are equipped with. Some features are related to hardware, such as camera, video, audio, multi-touch gestures, voice sensor, clock, alarm, timer, reminder, search, calculator, calendar, color touch screen, gyroscope, accelerometer, GPS

navigation, sensors, high-speed data transfer, a knowledge repository, analysis resources, multiple device access, augmented reality, barcode scanner, WAP browser, HTML browser, flicking, tapping, pinching, stretching, Infrared, NFC, GPS, GPRS, FM, Bluetooth, MMS, personal hotspot, Java, and location tracking. Other features are related to software: mobile instant messengers such as WeChat, Skype, Facebook messengers, visualization, audio production apps, video production apps, writing apps, editing apps, data analysis apps, social networking apps, and to name a few. Still other features are network-related, such as EDGE, WCDMA, WLAN, HSAPA, 3G, 4G, 5G, Wi-Fi, context-aware mobile cloud services, connectivity, mobility, compatibility, and interoperability.

As mobile has different operating systems, such as iOS, Android, Windows, BlackBerry OS, or FireFox OS, it can be equipped with different mobile features accordingly. They may share some fundamental features while differ in other features. Essentially, however, mobile features of all kinds are leveraged in one way or another to enhance mobile performance for different purposes.

As the cornerstone of mobile, mobile features have been playing a significant role in mobile communications of all kinds, ranging from mobile government to mobile parenting. Therefore, it is imperative to compare how mobile features have been leveraged by mobile users. And it is equally imperative to compare how mobile features have been leveraged in different countries or cultures since this world is increasingly interdependent and inter-influenced.

For comparing mobile features in an effective way, it is crucial to design a better way of categorizing them. Since they can be categorized differently, mobile features should be properly grouped according to different purposes of comparing mobile features.

In an earlier study, mobile features were classified into three major categories: hardware, software and communication (Flora, Wang, & Chande, 2014). By hardware features, Flora, Wang and Chande meant to refer to less power, input mechanism, screen size and form factor, start-up time, physical parameters, device fragmentation while by software features, they referred to user experience, user interface, integration with other apps, action feedback, error notification, application focus, experienced resource, convenience, responsiveness, personalization, localization, readability, encryption, expire sessions, request validity period, prevent repeat request. In their definition, communication features referred to network connectivity. Although Flora, Wang and Chande did a neat and nice job in grouping different features into three categories, their categorization, however, has overemphasized the technological side of mobile features, missing out other important features of the mobile-human interaction side.

Mobile features are used to perform different functions. Some features are used to enhance device performance while others are leveraged to produce content. Some are employed to entertain users while others are for empowering users. Therefore, for better comparison, mobile features can be grouped as follows: (a) device enhancement, (b) user entertainment, (c) content production, and (d) user empowerment.

Specifically, device enhancement features include location-awareness, multi-touch gestures, gyroscope, accelerometer, and wireless communication capability, sensors, high-speed data transfer, a knowledge repository, analysis resources, multiple device access, augmented reality, near field communication (NFC), personal hotspot, context-aware mobile cloud services, location tracking, connectivity, compatibility, interoperability, mobility, and usability. These enhancement features have been examined in isolation or different combinations (e.g., Head & Ziolkowski, 2012; Ho, 2012; Qi & Gani, 2012; Wu, Wu, Chen, Kao, Lin & Huang, 2012; Aharony, 2013; Chang, Wu & Hsu, 2013; Gohil, Modi & Patel, 2013; Jambulingam, 2013; Kim, Park, Lim & Kim, 2013; Madden, Lenhart, Cortesi & Gasser, 2013; Pagoto, Schneider, Jojic, DeBiasse & Mann, 2013; Oliveira, Noguez, Costa, Barbosa & Prado, 2013; Plaza, Demarzo, Herrera-Mercadal & García-Campayo, 2013; Ramanathan, Swendeman, Comulada,

Estrin & Rotheram-Borus, 2013; Riikonen, Smura, Kivi & Töyli, 2013; Shapiro-Mathews & Barton, 2013; Fortunati & Taipale, 2014; O'bannon & Thomas, 2014; Pielot, De Oliveira, Kwak & Oliver, 2014; Sendra, Granell, Lloret & Rodrigues, 2014; Ciampa, 2014; Suominen, Hyrynsalmi & Knuutila, 2014; Wei & Lu, 2014; Ben-Zeev, Schueller, Begale, Duffecy, Kane & Mohr, 2015; Zhao & Balagué, 2015; Yang, Li, Jin, Zeng, Wu & Vasilakos, 2015; Espada, Díaz, Crespo, Martínez, G-Bustelo & Lovelle, 2015). Although these features may vary in different operating systems, fundamentally, they do the same job, that is, to enhance mobile performance for different purposes.

One of the major functions of mobile is to entertain mobile users anytime anywhere. Instead of turning to TV in our living rooms for a movie or a show, we just take out our mobile devices to watch it. If we want to listen to music, we do not have to use a separate music player. If we want to enjoy singing, we do not have to go to a KTV lounge anymore. Instead, we just take our mobile to sing away a few hours with friends or family across time and space. We have also found ourselves ending up playing games via our mobile devices with friends or family instead of switching on a computer or a game console. Even for gambling, we do not have to fly or drive to a casino anymore, instead we can gamble via mobile. In brief, mobile devices are also be equipped with such user entertainment features (see Kim, Kim & Wachter, 2013 and Yang & Kim, 2012).) as games, music (Jambulingam & Sorooshian, 2013), play games for learning (Lu, Chang, Huang & Ching-Wen, 2014), and gamifications (Eng & Lee (2013).

Mobile is used largely to produce content of all kinds for different purposes, ranging from texting to video production. Among production features are SMS, email (Jambulingam & Sorooshian, 2013), story-telling apps (Bonsignore, Quinn, Druin & Bederson, 2013), visualization of invisible information (Schall, Zollmann, & Reitmayr, 2013), and productivity software (Wu, Wu, Chen, Kao, Lin, & Huang, 2012). Among countless different production apps, we can choose what we need and like to make a movie, a photo album, an audio clip or a video clip. We can also use them to write, edit and publish articles, blogs, and reports right from our mobile devices without switching on our desktop or laptop computers. Production features of our mobile devices have been playing a pivotal role in our mobile activities.

Mobile users can further be empowered to enhance their communications for different purposes by leveraging such user empowerment features as authenticity, collaboration, personalization, crowd-powered data collection, cross-space data mining, data analysis, and interactivity (e.g. Kearney, Schuck, Burden & Aubusson, 2012; Lee, Moon, Kim & Mun, 2015; Guo, Yu, Zhou & Zhang, 2014; Kearney & Maher, 2013; Gao, Bai, Tsai & Uehara, 2014).

As part of the essential components of mobile, mobile features have been examined in many different dimensions. In comparing mobile features, it is crucially necessary to map what has been done in the past to locate similarities and differences in leveraging mobile features. For illustration, we reviewed the most recent studies that have been published since 2012. Using key words "mobile features", our search on Google Scholar generated 150 research articles, including some important conference papers that have been cited by other scholars in their respective studies.

Out of 150 studies we reviewed, only seven studies were comparative in nature. In their study, Fortunati and Taipale (2014) compared the advanced use of mobile phones in five European countries (Italy, France, Germany, Spain and UK). They found that substantial differences existed in the advanced use of mobile phone and its predictors in these countries. Another finding was that only about one third of the studied mobile features were exploited. And the extensive under-utilization of mobile features, they found, the mobile phone as a tool of social labor was efficiently exploited by the minority. Their further finding was that limited use of advanced features resulted in the new patterns of social stratification (Fortunati & Taipale, 2014).

In another comparative study, Lu, Chang, Huang and Ching-Wen (2014) investigated use of two game features (context-awareness and story generation) really influenced students' attitudes towards using such educational mobile role-playing games in Canada and Taiwan. They found that the story generated in CAM-RPG positively influenced users' attitude towards game use and increased users' perceived game usefulness, especially for the male students. They also found that natural language processing, location-awareness, multiple input forms, social networking, and student modeling could provide students with effective and efficient mobile learning experiences. Their further findings showed that context-awareness features of the game might be less important for the game-play although it did not affect their attitude towards using the game and that subject selection, such as learning environment, selected learning topic, and learning materials, would be an important issue in order to make users aware of the advantages of a context-aware mobile educational game (Lu, Chang, Huang & Ching-Wen, 2014).

In still another comparative study, Chong, Chan and Ooi (2012) investigated the factors that would predict consumer intention to adopt m-Commerce in Malaysia and China. They found that new variables such as trust, social influence, variety of services, and cost would predict consumer decisions to adopt m-Commerce in both Malaysia and China. Malaysian consumers, however, they found, were more concerned than their Chinese counterparts with the variety of services offered by m-Commerce. But both Malaysian and Chinese consumers, they further found, were price conscious in m-Commerce (Chong, Chan and Ooi (2012).

In comparing users' attitudes toward the use of mobile devices in second and foreign language learning in higher education in China and Sweden, Viberg and Grönlund (2013) found that respondents' attitudes toward mobile learning were very positive with individualization being most positive (83%) followed by collaboration (74%), and authenticity (73%). Hofstede's factors of cultural dimensions (power distance index, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance index, long term orientation versus short term normative orientation, and indulgence versus restraint) were found to be unable to explain the differences in mobile-assisted language learning (MALL) attitudes. Among the personal factors, however, gender could explain the differences in students' attitudes toward MALL (Viberg and Grönlund, 2013).

In their comparative investigation of use of the web browser, e-mail, applications such as Facebook or Google Maps, extractive usage, and immersive use in USA and Germany, Humphreys, Von Papeand Karnowski (2013) found no siginificant difference between mobile devices and non-mobile devices. Besides linguistic differences in calling mobile Internet, they did find any other significant difference in using mobile Internet. In both countries, according to their findings, the context very much shaped the mode through which people used the mobile Internet and having only a mobile phone at hand could foster an extractive use and make an immersive Internet use less likely (Humphreys, Von Pape & Karnowski, 2013).

To compare mobile and desktop, Güler, Kılıç and Çavuş (2014) investigated difficulties in instructional design processes. They found difficulties experienced in instructional design processes for mobile devices and desktop computers tended to be similar in developing learning content. And they also found that difficulties in internal design and production and front-end analysis were significantly different in terms of the Internet connection in personal mobile devices. Further differences were also located in their study that external design and development difficulties, rolling-out difficulties and total scores were significantly different with regard to levels of Internet experience (Güler, Kılıç & Çavuş, 2014).

In comparing product and service brand categories, Kim, Lin and Sung (2013) investigated their similarities and differences through addressing the following research questions: RQ1: To what extent

do branded apps incorporate vividness, novelty, motivation, control, customization, feedback, and multiplatforming? What are the differences and similarities between product and service brand categories? RQ2: Do branded app types (informational versus experiential apps) differ according product and service brand categories? RQ3: What message strategies are used most frequently in branded apps? What differences and similarities exist between product and service brand categories? RQ4: To what extent do branded apps offer consumers brand-related content, and what types of content are frequently offered?

And among other findings, Kim, Lin and Sung (2013) found that use of each engagement attribute (vividness, novelty, motivation, control, customization, feedback, and multiplatforming) varied by brand category and that animation and background sound were more frequently used in product brand apps than service brand apps. Further difference was also found in that informational message strategies were more frequently employed by service branded apps than those of product brands and just the opposite for transformational message strategies.

Judging by the seven comparative studies, it is obvious that only limited number of mobile features have been compared only in a small number of countries being compared: Malaysia and China, Canada and Taiwan, China and Sweden, USA and Germany, and Italy, France, Germany, Spain and UK.

Although non-comparative in nature, the majority of the most recent studies provided us with clues and inspirations for further comparative studies. For instance, based on the research questions addressed and/or hypotheses tested in the most recent studies, the following areas may inspire future scholars in their comparative studies of mobile features: (a) most important features being used (Jambulingam & Sorooshian, 2013), (b) perceptions of usefulness of mobile features, (Mayfield, Ohara, & O'Sullivan, 2013; O'bannon, & Thomas, 2014), (c) diffusion patterns of mobile features (Riikonen, Smura, Kivi & Töyli, 2013), (d) effects of mobile features (Ho, 2012; Glackin, Rodenhiser, & Herzog, 2014), (e) motivations of using mobile features (Teodoro, Ozturk, Naaman, Mason & Lindqvist, 2014, February; Ciampa, 2014), (f) use of mobile features in providing personalized sightseeing tours (Anacleto, Figueiredo, Almeida, & Novais, 2014), (g) likes and dislikes of mobile features (Grindrod, Li, & Gates, 2014), (h) users' readiness to accept marketing (Persaud, & Azhar, 2012), (i) facilitators and barriers of using mobile features (Dale Storie MLIS, 2014), (j) implementation of behavior change techniques in apps (Yang, Maher, J& Conroy, 2015), (k) interactive design and gamification of ebooks for mobile and contextual learning (Bidarra, Figueiredo, & Natálio, 2015), (l) mobile security (La Polla, Martinelli & Sgandurra, 2013; Jain & Shanbhag, 2012), (m) mobile augmented reality (Pendit, Zaibon & Bakar, 2014; Ke & Hsu, 2015), (n) context-aware mobile features (Mizouni, Matar, Al Mahmoud, Alzahmi, & Salah, 2014).

In future comparative studies of mobile features, we may wish to compare perceptions of usefulness of mobile features. And closely related to perception comparison is reality check, that is, to compare in reality to what extent and what type of mobile features are actually embedded in apps and used by mobile users. Similar investigations can be conducted to compare motivations, diffusion patterns, areas, and effects of using mobile features. And topics to be compared include likes and dislikes of mobile features, facilitators and barriers of using mobile features, mobile privacy, safety, and security, use of mobile augmented reality, context-aware mobile features. And all these comparative studies can be conducted among different demographic (age, gender, race, education, sexual orientation, marriage status, occupation, income, level of mobile savviness) groups within one country or culture and between countries or cultures.

To get a holistic picture of what mobile features have been fully leveraged as well as similarities and differences in leveraging mobile features, there should be more countries and more features to be com-

pared due to changes in mobile technologies, user, behavior, needs, tastes, and preferences. For instance, more studies should be conducted to examine how countries would fare in leveraging mobile features, how mobile applications would fare in leveraging mobile features, how different types of mobile features would fare in terms of being leveraged, and how factors would work together in shaping similarities and differences in leveraging mobile features.

In terms of country-specific comparison, we would like to suggest that mobile features should be compared between developed countries, between developing countries, between underdeveloped countries, or between developed and developing or underdeveloped countries.

As far as mobile applications are concerned, it is also desirable to compare them in order to locate similarities and differences between mobile apps in leveraging mobile features. For instance, are there any similarities or differences between mobile health apps and mobile banking apps in leveraging mobile features? Similar questions could be addressed between mobile learning and mobile teaching, between mobile dating and mobile romancing, between mobile public relations and mobile branding, between mobile advertising and mobile journalism, or between mobile shopping and mobile entertainment.

In comparing different types of mobile features, it is important to locate similarities and differences in leveraging mobile features. For instance, do user entertainment features differ from user empowerment features in terms of how and to what extent they have been leveraged. Are production features different from device features in terms of how and to what extent they have been leveraged?

To locate shaping factors, comparison should also be made to identify different factors that have worked in isolation or combination in shaping similarities and differences in leveraging mobile features.

To compare mobile features in the future, we would like to propose a 3M framework: to map, to measure and to model. To map mobile features is designed to locate where mobile features are leveraged. To measure mobile features is to gauge the levels of leveraging mobile features in different areas. To model mobile features is ultimately meant to come up with a model to describe, explain and predict use and effects of mobile features.

It is not exaggerated to say by now that mobile is everything and everything is mobile since mobile has penetrated in not only every country's population but also every single occupation. Against such a backdrop, we need to map where mobile features are being leveraged.

Mobile features can be mapped under the following four categories: (a) device enhancement, (b) user entertainment, (c) content production, and (d) user empowerment in the following three domains: (a) countries, (b) mobile devices and (c) apps. To map mobile features in countries, we may take into account the developed, developing and underdeveloped countries in our comparison. In terms of mobile devices, it is necessary to identify what mobile features are leveraged in smartphones and non-smart phones. As far as apps are concerned, it is equally necessary to locate what mobile features are being leveraged in different apps, ranging from mobile government to mobile gambling.

It may be advisable to employ social network analysis to map mobile feature in different countries, mobile devices and apps. With the results of social network analysis, we will be able to have a holistic picture of both dimensions and frequencies of four types of mobile features being leveraged in three domains.

To measure mobile features is to gauge the number, frequency and degree of (a) device enhancement, (b) user entertainment, (c) content production, and (d) user empowerment in three domains: (a) countries, (b) devices, and (c) apps by using one standardized codebook.

In terms of measurement, the number of leveraging mobile features can be measured on a 5-point scale with 1 being the minimum while 5 being the maximum in terms of number of mobile features

being leveraged under each mobile feature category. And the same 5-point scale is also applied in measuring the frequency with 1 being the least frequent while 5 being the most frequent. And the degree of leveraging mobile feature can be measured on a 5-point scale with 1 being the least use while 5 being the heaviest use.

Use of mobile features can be influenced and shaped by different factors. Among them are political, economic, cultural and social factors in a country. These factors can be called external factors. Politically, if a country is democratic, open and free, then its mobile users will tend to use more mobile features to seek and follow information flow within and outside the country than those in less democratic, open and free countries. Economically, if a country is more developed, its mobile users tend to afford to use of more cost-incurring mobile features than those in less or under developed countries. Culturally, if a country is more open, aggressive, and globalized, then its mobile users may use more mobile features than those in less open, aggressive or globalized countries. Socially, if a country is more tolerant and welcome to new things and/or ideas, then its mobile users may use more mobile features than those in less tolerant and welcome to new things and/or ideas.

On top of these factors, there are other factors. For instance, demographics of mobile users including age, gender, education, income, sexual orientation, marital status, race, occupation and level of mobile savviness can play a very important role in influencing and shaping the number and frequency of leveraging mobile features. Besides demographics, motivations, expectations, experience, and perceptions may also shape use of mobile features. These factors can be called internal factors.

Among those factors, which factor or factors play a bigger part in shaping use of mobile features? And how does it or do they shape use of mobile features? Is there any pattern being formed among any shaping factors? Answers to these questions and more will generate a model for describing, explaining and predicting changes in use of mobile features.

In order to get the answers to all the questions regarding use of mobile features, mixed research methods, in other words, mixing quantitative methods with qualitative methods, should be employed instead of purely quantitative or qualitative methods. Different research methods used can triangulate the results of each research method so that more reliable and accurate results can be generated.

Specifically, a nation-wide survey can be conducted in different countries to collect data regarding mobile users' motivations, expectations, experience, preferences, and perceptions in relation to mobile features. Those data, together with those demographic data generated from the nation-wide survey, can be compared from country to country. As for the external factors, country-specific data can be obtained from the authoritative sources such as UN, World Bank, and UNESCO.

## Further Studies of Mobile Journalism

As another example of dimensions and directions of further studies of mobile use, mobile journalism can be investigated and compared as follows:

Mobile has been leveraged by professional and freelancing journalists in news reporting and writing, revolutionizing the way news is reported, designed, delivered, and consumed around the world. Mobile has been redefining news, journalists, and journalism, restructuring and reshaping the news industry. We are not just passive recipients of news as we used to be in the age of mass media and communication. Instead, through social media, especially mobile social media, we can follow news and news cam follow us anytime anywhere. Mobile journalism has been practiced by not only professional journalists

but also non-professional journalists or simply every citizen who would like to report or share news. It is an open concept where everyone can be a journalist, be it a reporter, an editor or an anchorperson. In the age of mobile journalism, there is no fixed deadline for news as it can be reported anytime anywhere in the mobile space. There is no more clear media division like in the old days when we had radio news, TV news or newspaper news separately. Instead, we have multimedia news or news designed in different media but delivered to the same medium, that is, mobile. Mobile journalism is not just a gear but a game changer (Bivens, 2008) in journalism and the news industry.

Mobile journalism has been examined in the past by many scholars around the world, generating an increasing amount of scholarship. A quick review of Google-Scholar-curated academic publications on mobile journalism has spotted a general focus on largely any of the technology-specific, country-specific, citizen-specific, professional-specific, method-specific, time-specific topics.

Among previous studies, for instance, some have investigated (a) mobile news as a model (Mills, Egglestone, Rashid & Väätäjä, 2012; Scolari, Aguado & Feijóo, 2012; Westlund, 2013; Wolf & Hohlfeld, 2012), (b) user experience (Bethell, 2010; Väätäjä, 2008; Väätäjä, Koponen, & Roto, 2009; Koponen & Väätäjä, 2009; Väätäjä, 2010, November; Wigelius & Väätäjä, 2009; Väätäjä, Männistö, Vainio & Jokela, 2009; Väätäjä & Roto, 2010), and (c) skills (Powers, 2012; Wenger, Owens, & Thompson, 2014).

Others have examined (a) tools, (Jokela, Väätäjä & Koponen, 2009), (b) impact (Martyn, 2009; Clarke & Bromley, 2012), and (c) perceptions, needs and challenges (Väätäjä & Egglestone, 2012).

Still others have looked into (a) immediacy and openness (Mudhai, 2011), (b) delivery (Fidalgo, 2009), (c) location-based design (Bjørnestad, Tessem & Nyre, 2011; Goggin, Martin & Dwyer, 2015) and augmented reality design (Pavlik & Bridges, 2013), (d) production and consumption (Aguado & Martínez, 2008; Westlund, 2014), (e) participation (Verclas & Mechael, 2008;), and (f) empowerment (Berger, 2011).

For further studies, as Westlund (2012) proposed, we should use "mixed approaches and methods, preferably aiming for cross-cultural comparisons rather than national studies, and time-series rather than cross-sectional studies" (p. 22). Moreover, he also suggested inclusion of both production and consumption of mobile news for future research.

Through comparing mobile journalism being practiced and researched around the world, we will be able to identify universal features and particular characteristics of mobile journalism in different countries or cultures as well as to locate changes and patterns in mobile journalism globally or locally.

Specifically, mobile news designing and delivering should also be compared since these are the two major areas in mobile journalism.

Obviously different from the traditional news media and communication in designing news, mobile journalism has its own unique ways of designing and packaging news for mobile consumption on the go. In order to grab fragmented attention on the go in competition with traditional news media, mobile news designing has become increasingly essential and indispensable. By leveraging mobile features available, mobile news designing is expected to entice, entertain, engage, empower, and enlighten mobile users on the go anywhere anytime via any device.

Similarities and differences have been generated in designing mobile news in different countries but yet they have not been well examined and compared. Few longitudinal or comparative studies have been conducted to map and measure those similarities and differences systematically. Therefore, it is highly urgent to come up with a systematic way to compare and keep track of changes and patterns in similarities and differences in designing mobile news.

Mobile journalism can also differ in delivery. And delivery can be highly customized and personalized according to mobile users' needs, tastes and preferences in terms of mode, time, venue, or channel to deliver mobile news.

Mobile news can be delivered through subscriptions, micro-payment or free of charge with ads. It can also be delivered through email to our inbox directly according to our needs, tastes and preferences for news. In terms of time, mobile news can be further delivered to a specific time of our choice. It can also be personalized in light of our chosen venue or channel.

Delivery can also be done in a cross-media fashion. In other words, one news story can be designed and packaged differently using different media and it can be delivered across media to us so that we can decide when to read, view or listen to news according to different situations we happen to find ourselves in or different moods or needs for different media. For instance, after knocking off in a car while driving, we would prefer for a news story to be delivered via radio so that we can listen to news if we have used our eyes on different screens for too long and it is about the time for us to rest our eyes. After they reach home, we would prefer to watch news stories delivered in video format, which can be scheduled to be watched over dinner time with our families.

Mobile news can also be delivered according to types of phones we use. If we use feature phones, we would prefer to have news delivered to us in text or at least low graphic format if some photos are still expected to go along with stories. If we use smart phones, we would definitely like to have multimedia stories to be delivered to our devices. And we may even want ourselves to be totally immersed in a mix reality, where we would experience news stories in a totally different way, which would allow us to experience news in a virtual, real and mixed fashion.

Based on the results of previous studies and what should be examined, mobile journalism in different countries can be compared in many different areas. In this chapter, we would like to select the following areas for comparison: (a) roles, (b) features, (c) experience, (d) impacts, (e) issues, and (f) factors.

As mobile journalists can play different roles, ranging from informing to entertaining, it is crucial to compare what roles mobile journalists want to play, what roles are actually played and the gap between the two. Among the normative roles, there may exist different emphases on the same set of roles to be played by mobile journalists. And it is also necessary to run the whole set of comparative studies in the case of freelancing mobile journalists and mobile news consumers. What roles do freelancing mobile journalists want to play? What roles do mobile news consumers want mobile journalists to play? What roles do they actually play most in reality in the eyes of freelancing mobile journalists and mobile news consumers respectively?

Another area to be compared lies in features of mobile journalism. There are many different features, ranging from ubiquitous news reporting to unique news consumption. Due to political, social, economic and cultural differences, the same features can be treated differently or emphasized differently. Some features can be universal as they are treated more or less the same around the world. Other features can be country-specific or particular. Still other features can be hybrid, meaning a combination of universal and particular features in practicing mobile journalism.

Features can be generally reflected in design and delivery of mobile news. In terms of design, mobile journalism can be very different from that of traditional news media. In the age of mass media and communications, news was designed for radio, TV, newspapers or magazines, featuring medium-specific design and presentation. In mobile journalism, news is designed for entice, entertain, engage, empower, and enlighten mobile users on the go anywhere anytime across time and space barrier within fragmented time and space. Different from traditional news delivery, mobile news is delivered through not only apps

and mobile-friendly sites but also various mobile social media. Its delivery is not only push, pull or hybrid but also tailored and customized to the full according to different needs, tastes and preferences by leveraging mobile features and functions.

A comparison should also be conducted to investigate what specific features mobile users, freelancing mobile journalists and mobile journalists respectively would like to have in mobile journalism, what they actually have as well as the gap between the two.

In the mobile space, although content remains essential, what is indispensable is experience. News is everywhere these days. If you do not get it through one medium, you will surely get it through another medium. If you are not being followed by news via one medium, you will end up being followed via another medium. News is everywhere. In this ubiquitous news environment, what has become more important is not just news itself, but rather how it is being experienced, which makes a huge difference in terms of impression and impact. Experiencing news on the go is very different from the conventional way of experiencing news on radio, TV, newspapers, or news magazines. And it can also be very different in different countries. Hence it is essentially important to compare mobile news experience to locate similarities and differences. Mobile news experience can be compared at six different stages of mobile news consumption: (a) enticement, (b) entertainment, (c) engagement, (d) empowerment, (e) enlightenment, and (f) enhancement. And the comparison should be three-fold, meaning we should compare the normative experience, the empirical experience and the gap between the two.

Ever since its inception, mobile journalism has been influencing and reshaping the way news is reported, designed, delivered, consumed, and leveraged. Furthermore, it has also incurred great changes in different countries socially, economically, culturally, and politically. Therefore, it is another major area for comparative studies of mobile journalism.

Issues in mobile journalism can be similar or different in different countries. It should also be part our comparative investigation to locate similar or different issues in different countries so that we will have a better understanding what is universal and what is particular when it comes to issues in mobile journalism.

The last but not the least area is the question why mobile journalism is practiced differently in different countries. To map and measure those differences is not the end of the story. To take one step further, those identified differences should be well described, explained and predicted by locating different factors.

To collect data on those three areas of mobile journalism, it is our suggestion that surveys, focus groups and interviews should be conducted in isolation or combination. On top of these research methods, we also recommend a cross-country content analysis of mobile news apps or mobile sites to gather related data for comparison. Different methods, qualitative or quantitative, can be used employed to triangulate the results of different comparisons using different methods.

Among the identified roles of mobile journalism are (a) to inform, (b) to entertain, (c) to educate, (d) to share, (e) to monitor, (f) to collaborate, (g) to investigate, and (h) to change. But these roles may not be supposed to be played universally. Instead, mobile journalists may play different roles in different countries. Even within the same country, different mobile journalists from different news media organizations may also play different roles. Furthermore, amateur mobile journalists may also play different roles. The differences may also exist in their orientations and prioritizations. In other words, although they may play a set of similar roles, but they may prioritize them differently.

These roles can be compared first on the normative level. In other words, we should compare what roles mobile journalists and freelancing mobile journalists want to play and what roles they have actually played. Furthermore, we also need to compare what roles mobile users want mobile journalists to play

and what roles they have actually played in the eyes of mobile users. The comparison can be conducted through a survey by asking mobile journalists, freelancing mobile journalists and mobile users to rate the importance of the identified roles on a Likert scale: 1 for the least important while 5 for the most important.

After being compared on the normative level, these roles can be further compared on the empirical level. That means that we should compare what roles mobile journalists and freelancing mobile journalists have actually played in a country. And mobile users should also be asked to rate the level of actual performance of these roles on a Likert scale: 1 for the least played while 5 for the most played.

After comparing both normative and empirical roles respectively, we can place the results of the two comparisons in perspective so that we can locate the various gaps between the normative and empirical roles. The gaps can also be measured on a Likert scale: 1 for the narrowest gap while 5 for the widest gap.

Features of mobile journalism can differ in terms of availability, accessibility and usability from one device to another, from one person to another, from one country to another although features can be universally the same due to the same set of mobile technological advances available to everyone in the world. Features can also be highly different when it comes to how they are leveraged in reporting, writing, designing and delivering news anytime anywhere via any device.

The available features of mobile journalism can be broadly divided into the following categories: (a) immediacy, (b) openness, (c) interactivity, (d) multimedia, (e) immersion, (f) ubiquity, (g) geo-tagging, (h) gamification, (i) location-based services, and (j) mixed reality.

Immediacy is a feature that distinguishes mobile journalism from its conventional counterparts. News reporting in the case of mobile journalism can be immediate, or specifically speaking, not only instantaneously but also simultaneously. No traditional news media can have that level immediacy. With a mobile device, anyone can report and share anything via social media sites or apps immediately. It is even more important and crucial in terms of live coverage of a general election (Mudhai, 2011).

Another outstanding feature of mobile journalism is openness (Mudhai, 2011). Closely related to this feature is the civic engagement in mobile journalism (Lasica & Firestone, 2008). And it is also the main pitch of what open journalists have been passionately advocating around the world (Aitamurto, 2013; Rusbridger, 2012).

As one of the prominent features of mobile journalism, interactivity can mean different things to different journalists or different news media. It may also differ in terms of how interactivity should be and is actually leveraged in mobile journalism. Interactivity can also mean co-creation of content on mobile between mobile journalists and mobile news consumers, in which a news story is unfolding involving user participation in contributing new information, views and new elements to be added to enrich the news story.

Multimedia is another feature, which can differ among mobile journalists, mobile news providers and mobile news consumers. It may refer to photo, image, audio or video galleries separately to some while to others it may also refer to an integrated use of different media elements within a story.

As an emerging feature, immersion has become more and more aware of and used in designing and delivering news for mobile devices. Specifically speaking, immersion can also be different in not only definition but also how it has been actually leveraged. Gamification is an example of how to immerse a mobile user in mobile news production and consumption. And use of mixed reality is another.

As one of the outstanding features of mobile journalism, ubiquity is of ultimate importance in reporting, designing and delivering news for mobile users who can be connected and who are in need of news

anytime anywhere on the go. So to what extent has this feature been leveraged by mobile journalists or mobile users? The answer can also be different in different countries.

Mobile news, co-created by professional or amateur journalists, can be geo-tagged in that geo-sensitive-or-specific information or elements can be clearly marked, stored, embedded in a news story so that it can be called up anytime anywhere via any device for in-depth and further reference, understanding or update. In terms of what to be geo-tagged and how it should be different on the individual level according to different individual needs, tastes and preferences. It can also be very different on the corporate level according to the nature, type, target audience, and venue of news media.

Gamification, by definition, refers to use of gaming elements to enhance mobile experience in the context of mobile news communication.

Location-based services are becoming increasingly leveraged in mobile journalism to enhance mobile news communication (Bjørnestad, Tessem & Nyre, 2011; Goggin, Martin & Dwyer, 2015; Watkins, Hjorth & Koskinen, 2012; Väätäjä & Egglestone, 2012).

Although not often or rarely leveraged in designing and delivering mobile news, mixed-reality has presented itself as a high promising turf (Väätäjä & Männistö, 2010) to enhance mobile news communication anytime anywhere via any device.

The ten key features of mobile journalism should first be compared among mobile journalists, freelancing mobile journalists and mobile users to measure the level of importance being paid by mobile journalists, freelancing mobile journalists and mobile news consumers to each of these ten features by using a Likert scale with 1 for the least important while 5 for the most important.

Besides the normative side, these ten key features should also be compared on the empirical level, meaning that the level of each of these ten features can be compared among mobile journalists, freelancing mobile journalists and mobile news consumers with 1 for the least leveraged while 5 for the most.

As far as the gap between the normative and the empirical features of mobile journalism are concerned, naturally once the results of both normative and empirical comparisons are placed in perspective, we will obtain a holistic picture of the gap among mobile journalists, freelancing mobile journalists and mobile news consumers.

In the mobile news industry, although content remains essential, what is indispensable and important, however, is experience. News is everywhere these days. If you do not get it in a medium, you will surely get it in another. If you are not being followed by news in a medium, you will end up being followed in another. In this ubiquitous news environment, what has become more important is not just news itself, but rather how it is being experienced, which makes a huge difference in terms of impression and impact. Experiencing news on the go is very different from the conventional way of experiencing news on radio, TV, newspapers, or news magazines. And it can also be very different in different countries. Hence it is essentially important to compare mobile news experience to locate similarities and differences.

Mobile news experience can be compared at different stages of mobile news consumption, which normally starts with how mobile users are enticed to news within the first few seconds by three key elements at the enticement stage (a) appealing interface, (b) easy navigation, and (c) interest-arousing. Using a Likert scale with 1 for the least enticed while 5 for the most enticed, mobile news experience at this stage can be compared through measuring its normative and empirical dimensions as well as the gap between the two with 1 for the narrowest gap while 5 for the widest gap.

At the entertainment stage, mobile news experience can be compared through measuring three key elements: (a) fun, (b) pleasure, and (c) satisfaction. Using a Likert scale with 1 for the least entertained while 5 for the most entertained, mobile experience at this stage can be compared through measuring

its normative and empirical dimensions as well as the gap between the two with 1 for the narrowest gap while 5 for the widest gap.

In the case of engagement, mobile news experience can be compared through measuring three key elements: (a) searching, (b) interacting, and (c) sharing on a Likert scale with 1 for the least engaged while 5 for the most engaged. Mobile experience at this stage can be compared through measuring its normative and empirical dimensions as well as the gap between the two with 1 for the narrowest gap while 5 for the widest gap.

At the empowerment stage, mobile news experience can be compared through measuring three key elements: (a) selecting, (b) commenting, and (c) producing. Using a Likert scale with 1 for the least empowered while 5 for the most empowered, mobile experience at this stage can be compared through measuring its normative and empirical dimensions as well as the gap between the two with 1 for the narrowest gap while 5 for the widest gap.

At the enlightenment stage, mobile news experience can be compared through measuring three key elements: (a) awareness, (b) understanding, and (c) consciousness, using a Likert scale with 1 for the least enlightened while 5 for the most enlightened on both normative and empirical levels. The gap between the two can be compared with 1 for the narrowest gap while 5 for the widest gap.

Mobile news experience at the enhancement stage can be compared through measuring three key elements: (a) knowledge, (b) skills, and (c) abilities on both normative and empirical levels, using a Likert scale with 1 for the least enhanced while 5 for the most enhanced. The gap between the normative and empirical enhancement can also be compared with 1 for the narrowest gap while 5 for the widest gap.

Mobile news services and mobile apps have been reshaping news communication and newsroom operations, making news reportable and available besides what Westlund (2012) described as accessible anytime, anywhere, and through any device. News writing, reporting, designing and delivering have all become personalized on the go way beyond what Goggin (2006) had described as radically personalized news-gathering. These are just examples of the industry-specific impacts of mobile journalism.

The impacts of mobile journalism are also social, cultural, economic, political, and individual since mobile journalism has been changing the way we vote in elections of all kinds, the way we understand our world, the way we interact with each other, the way we receive, process and share information and knowledge locally, nationally or internationally.

To compare the impacts of mobile journalism, we have to come up with an overall comparative framework. The one we would like to suggest is to cover impacts on the societal, industry-specific and individual levels. On the societal level, we would like to propose to focus on the social, economic, political and cultural impacts of mobile journalism. And those impacts should be measured on both normative and empirical levels. And the gap between the two should also be measured. On the industry-specific level, we include the impacts on news writing, reporting, designing, delivering, and functions. On the individual level, our proposed focus would be placed on the impacts of mobile journalism on the individual news needs, tastes, preferences, and experience. And those impacts should be measured on both normative and empirical levels. And the gap between the two should also be measured. It is our belief that this three-fold framework would be more accurate in capturing and comparing similarities and differences regarding the impacts of mobile journalism in different countries.

Among the identified issues in mobile journalism are infrastructure, safety, mobile capacity (Wigelius & Väätäjä, 2009), privacy, (Quinn, 2011), digital literacy, functionality, usability (Watkins, Hjorth & Koskinen, 2012), connectivity cost and reliability (Bethell, 2010), citizenship, identiy and local public sphere (Berger, 2011), and user experience (Väänänen-Vainio-Mattila & Väätäjä, 2008).

Issues can differ from country to country due to different political, social, economic and cultural backgrounds and conditions. For a cross-country comparison of issues in mobile journalism, we can compare those identified issues falling into the following categories: (a) credibility, (b) accuracy, (c) authority, (d) reliability, (e) depth, (f) privacy (g) ethics, (h) copyrights, (i) safety, (j) capacity, and (k) quality. And those issues can be compared on both normative and empirical levels.

Generally speaking, political, social, economic, cultural and technological factors may influence or shape the way mobile journalism operates in different countries. They constitute the overall environment. In this chapter, however, we would like to focus on those factors that have direct influence on mobile journalism. Specifically, mobile journalism can be more directly influenced by obstacles to access, limits on content, and violations of user rights.

The above paragraphs handled mobile features to illustrate how different dimensions of mobile use can be further investigated and compared. Using the same 3M approach and focusing on the gap between normative and empirical dimensions of mobile use related to mobile forms, formats, features, and functions may yield better and accurate findings regarding the impacts of mobile use. Mobile use can also be investigated and compared among different social media, native digital media or immigrant digital media. Mobile use may also be compared between or among immigrants, migrants, the marginalized, the handicapped, and the digital divides. Furthermore, integrated with mobile use are artificial intelligence, big data, deep machine learning, augmented reality, virtual reality, and mixed reality. These constitute further dimensions and directions of further studies of mobile use.

## FURTHER STUDIES OF MOBILE EXPERIENCE: DIMENSIONS AND DIRECTIONS

As experience economy is taking the centerstage and the world is increasingly dominated by mobile media and communication, mobile experience has become crucially important. Interconnected and interdependent with mobile use, mobile experience exists in all mobile activities. Besides the general conceptualization and operationalization briefly introduced in the first chapter of this volume, mobile experience has many dimensions and directions for further studies, including, among others, mobile experience in entertainment, gaming, tourism, leisure, journalism, healthcare, parenting, dating, government, advertising, marketing, and education. In this section, as a way to show how further studies of mobile experience may be conducted in what specific dimensions and directions, we propose a new approach to explain and predict mobile experience and recommend a new framework on how to maximize mobile experience to secure sustainable development.

## A NEW APPROACH TO EXPLANATION AND PREDICATION OF MOBILE EXPERIENCE

Factors influencing mobile experience in general that have been identified by earlier studies include location, social context, mobility, battery, application interface design, application performance, phone features, routine, and lifestyle needs (Ickin, Wac, Fiedler, Janowski, Hong, & Dey, 2012); emotions and memories (Kujala & Miron-Shatz, 2013), ease of use, awareness, security, usefulness, availability, and accessibility (Sarmento & Patrício, 2012); mobile site optimization (Djamasbi, McAuliffe, Gomez, Kardzhaliyski, Liu, & Oglesby, 2014); motor impairments and accessibility (Naftali and Findlater,

2014); gender differences such as responsive mobile design for female while dedicated mobile design for male (Silverstein, 2014); trust and privacy (Krontiris, Langheinrich and Shilton, 2014); load speed, site format, calculated download speed, social media presence, and app presence (Silverstein, 2013); personalization of content, structural navigation and representation (Chua, Wan, Chang, and Yi, 2014); and device capabilities and settings, network performance (Patro, Rayanchu, Griepentrog, Ma, and Banerjee, 2013), values, emotions, expectations, prior experiences, physical characteristics, personality, motivation, skills, usefulness, reputation, adaptivity (Arhippainen & Tähti, 2003), and attitude, social influence, media influence, perceived mobility, and perceived monetary value (Hong, Thong, Moon, Tam, 2008). Those factors can be generally described as internal factors, as they are closely related to all dimensions of mobile, that is, users, devices, apps, and networks.

Besides the internal factors, there are other factors that may shape differences in mobile experience. They can be called external factors. They may refer to social structure (degree of Homogeneity, extent to which egalitarian, communication patterns with the outside world, gender, ethnicity, generational cultures, religion, education provision and the support for literacy, and language), temporal structures of daily life (subjective experience of time, societal time use structures and cultural expectations about time), values (openness to technological innovation, the degree to which societies are individualistic or group-oriented, other culture values), communication (communication patterns and expectations and low and high context cultures), and material cultures (special considerations, national differences in housing characteristics, and artefacts) (Thomas, Haddon, Gilligan, Heinzmann & de Gournay, 2005). Other external factors may refer to social factors (time pressure, pressure of success and fail, etc.), cultural factors (habits, norms, religion, etc.), context of use (time, place, accompanying persons, temperature, etc.) (Arhippainen & Marika Tähti, 2003).

The above identified factors, internal and external, may shape mobile experience in one way or another. And most of earlier studies focused on factors that have shaped empirical experience, leaving the normative mobile experience and the gap between the normative and empirical mobile experience largely untouched.

Even within the examination of the empirical mobile experience, earlier studies did not investigate whether factors such as connection, curiosity, consumption, competitiveness, and creativity, which may have a role to play in shaping mobile experience. By connection, we refer to mobile connection, which constitutes the foundation of our mobile world, without which everything mobile would be impossible. Curiosity can enable mobile users to stay interested in exploring everything mobile. The more curious mobile users are, the more eager they are to experience everything mobile. Consumption means the overall consumption of mobile users in a country. The more mobile users consume on mobile, the more they would be exposed to mobile experience. Competitiveness refers to the level of the overall competitiveness of mobile users in a country. The more competitive mobile users are, the more they would be exposed to mobile experience. By creativity, we refer to the level of mobile users being creative in a nation. The more creative mobile users are, the more eager they would be to experience everything mobile experience (Xu, 2018).

After identifying these shaping factors, it is crucial to test different associations or correlations between or among those variables so as to design a model to describe, explain and predict mobile experience. The five factors are combined to constitute the environment that can shape different stages of mobile experience. The level of each of the five factors also constitutes the individual level of the environmental conduciveness. Combined, the five levels represent the level of the total environmental conduciveness.

As the overall the environmental conduciveness may be correlated with the overall mobile experience, it is also necessary to test the individual association between different variables at different stages of mobile experience. All these possible associations or correlations should be tested to determine their different inter-connections, interactions, and inter-influences, which can serve as a model to describe, explain and predict mobile experience in a country or in different countries around the world.

Guided by the results of testing all the different associations or correlations among different variables, one further important area not to be ignored is to compare how mobile experience can be enhanced in different countries or cultures. For effective and better comparison, we propose three key areas: (a) how all indicators of mobile experience can be enhanced in apps or mobile sites, (b) how mobile experience can be enhanced by leveraging users' changing tastes, desires and preferences, (c) how mobile experience can be enhanced by narrowing the gap between the expected and actual mobile experience, and (d) how mobile experience can be enhanced through general education on mobile experience enhancement.

Specifically, we should compare how all dimensions of mobile experience are properly embedded in an app or a mobile site so that its users can choose, customize and prioritize them according to their own desires, tastes and preferences. The second key area is to compare how to leverage all changes in mobile users' desires, tastes and preferences for mobile experience by combining different methods such as surveys, focus groups, interviews, and participant observations. The third area is to compare how the gap is narrowed between the normative and the empirical mobile experience. The results of the gap measurement should also be compared and triangulated to identify areas for enhancement. Further education, consulting and services on mobile experience can be provided to mobile professionals and general publics in different countries. A general education on mobile experience should be offered to mobile users at different levels through different means. Mobile experience won't be fully enhanced before mobile users and mobile content providers fully understand its changing forms, features and functions as well as how it can be leveraged to enhance mobile communication.

## MAXIMIZING MOBILE EXPERIENCE FOR SUSTAINABLE DEVELOPMENT

Other dimensions and directions for further studies of mobile experience include how to maximize mobile experience to secure sustainable development in the context of experience economy. It is especially important and crucial for developing and underdeveloped countries, where mobile may be the only widely and easily affordable and accessible medium which can be fully leveraged to secure and enhance sustainable development.

In September 2015, the United Nations approved 17 sustainable development goals to be obtained by 2030. They are (1) no poverty, (2) zero hunger, (3) good health and well-being, (4) quality education, (5) gender equality, (6) clear water and sanitation, (7) affordable and clean energy, (8) decent work and economic growth, (9) industry, innovation and infrastructure, (10) reduced inequalities, (11) sustainable cities and communities, (12) responsible consumption and production, (13) climate action, (14) live below water, (15) life on land, (16) peace, justice and strong institutions, and (17) partnerships for the goals (Division for Sustainable Development Goals, 2015). To achieve each of these 17 goals, mobile can be leveraged to assist, facilitate and expedite global joint efforts as mobile for development has become a global tagline and also a common practice worldwide, especially in the developing and underdeveloped countries. For instance, GSMA, representing "the interests of mobile operators worldwide, uniting more than 750 operators with over 350 companies in the broader mobile ecosystem, including handset and

device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors," (GSMA, n.d.) has put together a global team within its organization to "identify opportunities and deliver innovations with socio-economic impact in financial services, health, agriculture, digital identity, energy, water, sanitation, disaster resilience and gender equality" (GSMA Mobile for Development, n.d.).

As the only and single technology cutting across geographies, cultures and income levels, mobile is expected to bring about tremendous socio-economic growth to the emerging markets, as demonstrated by one of the examples provided by GSMA's Mobile for Development team, whose work has impacted more than 30 millions lives across 49 countries (GSMA Mobile for Development, n.d.). Another example is that GSMA Connected Society program is working to connect 1.09 billion people around the world who lack mobile broadband coverage and still another example is that "34 mobile operators worldwide have made 49 commitments to reduce the gender gap in their mobile money or mobile internet customer base" (GSMA Mobile for Development, n.d.).

According to GSMA Mobile for Development (n.d.), "over 1.5 million women and their families reached with life-saving health and nutrition information while 12.5 million smallholder farmers reached with mobile agricultural services to improve their crop yields and income". And GSMA Mobile for Development also reports that "1.6 million mobile-enabled, pay-as-you-go solar home systems installed" and that "the GSMA Digital Identity program is working with partners to develop and scale innovative identity solutions for the people who lack identification".

Having made such achievements in narrowing the digital or mobile gap between the haves and the have-nots, what seems to be more imperative is to maximize mobile experience behind each use of mobile to secure sustainable development goals. Undeniably, mobile use is a crucial step for development. To secure sustainable development, however, mobile use alone won't be effective or sufficient. Any emphasis of mobile use over its experience will result in reduced effectiveness and efficiency in leveraging mobile for development. It is recommended that both use and experience in leveraging mobile for development should be examined as an interconnected and interdependent whole.

It is also recommended that the six stages of mobile experience and the 3M approach with a focus on the gap between the normative and the empirical proposed by Xu (2018) can be applied in examining how mobile experience can be fully maximized to secure each of the 17 sustainable development goals. The six stages of mobile experience are (1) enticement, (2) entertainment, (3) engagement, (4) empowerment, (5) enlightenment, and (6) enhancement (Xu, 2018). Each of the generic stage of mobile experience can be specifically re-conceptualized and re-operationalized according to each of the 17 sustainable development goals.

For instance, the first goal is to eliminate poverty. To facilitate the global efforts to obtain that goal, mobile can be fully leveraged in national, regional and global coordination and collaboration in enabling mobile users in developing and underdeveloped countries to create or co-create opportunities for social and economic development. Resources and efforts can also be globally allocated through use of mobile. In light of this understanding, the first stage of mobile experience is to entice mobile users to join the efforts to eliminate poverty globally. The specific dimensions of enticement should be conceptualized and also operationalized so that it can gauged. For example, enticement may include being enticed to part of mobile inclusion and literacy, which is a must in leveraging mobile for development. The same procedure can be applied to the other five stages of mobile experience.

Once all the six stages of mobile experience are re-conceptualized and re-operationalized according to each of the 17 sustainable development goals, the 3M approach should also be applied, which consists

of mapping, measuring and modeling (Xu, 2018). To map is to locate where each dimension of mobile experience lies while to measure is to gauge the level, extent or strength of each dimension of mobile experience. To model is to test the association or correlation between or among identified variables that shape mobile experience. The gap focus of the 3M approach is to locate and gauge the disparity between what is expected and what actually is in terms of mobile experience. The identification and measurement of the gap can also aid and facilitate global efforts to maximize mobile experience for securing sustainable development.

The proposed framework of the six stages of mobile experience, accompanied by the 3M approach with a special focus on the normative and empirical gap, can also be applied to examine how mobile experience can be maximized in facilitating global efforts to obtain the other 16 sustainable development goals.

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