

What mobile devices mean to the 21st century teenagers?

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Abstract According to Pew's research report on teens and technology in 2015, 92 percent of the sampled teenagers go online daily and more than 50 percent of them use their smartphones several times a day. Today, teenagers and mobile devices are almost inseparable. Although many quantitative studies have been conducted to identify the perception on the integration of technology in education, only a few in-depth studies have been done specifically on the usage of technology by teenagers, as well as in learning. Therefore, a study was conducted to obtain an in-depth understanding of teenagers' usage of technology in Malaysia by employing the mixed method. Three males and three females aged between 13 and 17 years were selected to participate in this study. A checklist was used to track and identify the usage level of mobile devices among these teenagers, the main activities performed by them using these devices and the learning experience of using them over a period of two years. The first set was done in 2013 and the second one was conducted in 2015. Participants were also invited to take part in a subsequent interview session, following the first interview which was held two years ago. This paper addresses the changes of the teenagers' usage patterns on mobile devices, their experiences of using mobile devices to perform learning activities and perspectives on mobile learning over the designated period of two years. The findings reveal that teenagers are great digital explorers. Mobile devices have become an essential tool for a majority of them. Throughout these two years of tracking, it was observed that the teenagers did not keep to the same interests for long. Instead, their interests shifted over new games, new apps and interesting sites or videos. These teenagers admitted that they like to keep themselves preoccupied with different activities that can be performed using mobile devices. Some teenagers were aware that they were addicted to using mobile devices, especially their Smartphone to some extent. Without the mobile devices, teenagers felt "lost", "bored", "insecure" and "disconnected". Ironically, teenagers did not use their devices for learning consistently. They were only very occasionally used for some learning activities. This paper found that mobile devices are mostly entertainment devices for the teenagers to pass their time. As for the learning part, older teenagers are able to make use of such devices more efficiently compared to the younger ones, probably because the older group is more self-directed.

Keywords: Teenagers, mobile devices, learning

Introduction

The use of mobile devices by teenagers has increased rapidly over the years. The mobile devices that are mostly used by teenagers are smartphones, tablets and laptops. According to Lenhart (2015), the practice of "going online" to some teenagers is considered a habit. Undeniably, mobile devices are very convenient for teenagers due to the fact that apps can be downloaded rapidly. For many, it is the tool that eradicates the digital divide (Hall, 2013) and ushers in the access to entertainment and games as well to learning. This paper addresses the usage patterns of teenagers' both for entertainment and learning, the changes that transpired and their perspectives on the usage of mobile devices in a period of two years.

Literature Review

Sharples, Taylor and Vavoula (2010) defined conversation as the driving process of learning, through which mobile devices that served as a communication tool could make learning possible. West (2013) added that improved mobile infrastructure is crucial for achieving the full benefits of the technology revolution. Students are quite positive about the ways they think the use of mobile devices will transform their learning environment. Chóliz (2012) claimed that teenagers feel emotional discomfort when they cannot use the mobile phone. The study is supported by Ellicotte's (2013) study which stated that the increasing reliance on mobile phones and the internet is one of the symptoms of being a "phubber", who is defined as a person interacting with their phone rather than with a human being.

On the other hand, Morphitou (2014) identified that the most significant features for students using their smartphones to gain an advantage over their studies were downloading educational apps, reading class-related notes, articles and slides, and reading e-books. However, in earlier study done by Adam et al. (2013), even though 77% (69) students spend more than two hours every day using their smartphones, 70% of students have never used it to read an e-book and only five of those students have read more than ten books on this device.

In Wong's (2015) study, the respondents generally concurred that poor bandwidth affects their learning performance instead of the quality of mobile devices. Surprisingly, screen size is the lowest factor affecting learning for teenagers (Wong, 2015), compared with older learners (Mohamad, Hussin and Shahrudin, 2015). These findings contradict Jacob's (2014) study where he claimed that mobile devices must have larger displays screens. Many studies are conducted to examine the workability of mobile learning in higher education institutions. Teenagers and mobile devices' usage have also been conducted in different regions of the world. However, very little in-depth study has been done in finding out the meaning of mobile devices to the teenagers in Malaysian high schools. The teenagers will be the undergraduates one day. Thus, it is important to know Malaysian teenagers' habits of using the mobile devices at early age as the practice of mobile learning is becoming popular in higher education institutions.

Research Questions

1. What are the usage levels of teenagers in using mobile devices?
2. What are the main activities performed by teenagers using mobile devices?
3. How do teenagers feel when their mobile devices are not with them?
4. What are the teenagers' learning experiences in using mobile devices?

Methodology

A mixed methods approach was employed to explore the research questions. Quantitative data was collected through a weekly checklist which tracked the usage patterns of the participants, whereas, qualitative data was collected from the interviews. Three males and three females aged between 13 and 17 years old were selected two years ago and now they are between 15–19 years of age. A second interview was conducted after two years with the same participants. The purpose of this study was to obtain an in-depth view of how teenagers make use of their mobile devices in their daily activities.

Data and analysis

Participant A, Male

Participant A owned three different types of mobile devices. He perceived that different types of devices can be used to serve his varied purposes. He used his mobile devices mainly for entertainment and not for learning activities. After two years, he still insisted that learning should be done via a face to face mode in the presence of a teacher as

learning needs some form of interaction. The only learning activity he did was looking for the meaning of new words. As for the feeling of great discomfort in the absence of mobile devices, he commented that it was the same as reported two years ago. However, the reason he gave for keeping his mobile devices with him all the time was different. Two years ago, he felt the need to be connected with friends all the time as well as playing games. But now, he claimed that he felt empty and lonely without his mobile devices. His current purpose of using his mobile devices were more for information searching compared to the gaming purpose he mentioned previously.

Aspects	2013 (13-year-old)	2015 (15-year-old)
Main purpose of using mobile devices	<ol style="list-style-type: none"> 1. Gaming 2. Entertainment 3. Social Networking 	<ol style="list-style-type: none"> 1. Information searching & internet surfing for general knowledge and information. He claimed that this information doesn't help in his school work. 2. Watching movies 3. Social networking
Reason for feeling uncomfortable when not having mobile devices	Loss of connection with friends.	<p>"Life is boring without mobile devices"</p> <p>"Nothing to do at home after coming back from school."</p>
Perception on activities related to learning	"I can learn from gaming, knowing new vocabulary. I am learning while playing."	Learning and entertainment are two different things. He claimed that he couldn't learn much from gaming or watching movies. "I gave up gaming because it is a waste of time."

Participant B, Female

The usage level of mobile devices by participant B has doubled after two years. Her perspective of mobile devices in learning is remains the same. However, she asserted that the learning couldn't last for long without proper structure or organisation. This is probably due to the fact that young teenagers are still in the stage of seeking and fumbling while looking out for every possibility that technological devices could bring them.

Aspects	2013 (14-year-old)	2015 (16-year-old)
Main purpose of using mobile devices	<ol style="list-style-type: none"> 1. Playing games 2. Searching information 3. Reading e-books 	<ol style="list-style-type: none"> 1. Maintaining blog 2. Social networking 3. Playing games 4. Information search
Reason for feeling uncomfortable when not having mobile devices	"I feel neither uncomfortable nor comfortable for not having mobile devices."	"I am already used to it daily. I feel very uncomfortable if not using it for a day."
Perception on activities related to learning	"Learning is workable by mobile devices as long as I am interested."	"All information can be searched online!"

Participant C, Male

Participant C has variety of mobile devices but he only accesses the Internet a few times a week. He is also a multipurpose-device user. He only uses his devices for learning a few times a week for a maximum of one hour. The learning activities performed by him have not changed much as compared to two years ago.

Aspects	2013 (15-year-old)	2015 (17-year-old)
Main purpose of using mobile devices	1. Watching movie 2. Searching information 3. Listening to music	1. Playing games 2. Watching movie 3. Listening to music
Reason for feeling uncomfortable when not having mobile devices	“Because everyone has mobile devices, I will look strange if I do not own one”	“Not feeling uncomfortable because books and television are other tools for occupying the time.”
Perception on activities related to learning	“Teacher is still preferred by him for formal learning activities.”	“Learning using mobile devices are workable, but can be easily distracted by other stuff.”

Participant D, Female

Participant D is a multipurpose user. She claimed that she could find many interesting things by going online. Hence, she merely depends on the information found online using the smartphone regardless of its reliability. The participant still uses her mobile for learning occasionally, a practice that has not changed much in the last two years. But the usage pattern has seen an increase in variety. The participant spent around 5 – 7 hours per day with the phone “actively”. Learning activities are considerably low. Once the participant loses her interest; she switches to some other activity. She claimed that mobile devices can always “fulfill” her curiosity. The perception towards the mobile devices in learning has remained the same for the last two years. She claims that she is not a self-disciplined person and her passion towards certain online-learning activities can easily dissipate. This has shown that perseverance is the key and a necessity for the teenagers to perform mobile learning.

	2013 (15-year-old)	2015 (17-year-old)
Main purpose of using mobile devices	1. Learning occasionally 2. Reading e-books 3. Watching movie	1. Reading e-books 2. Listening to music 3. Watching movie
Reason for feeling uncomfortable when not having mobile devices	“I am fine without mobile devices for a day but not for a week!”	“I found insecurity if the phone is not with me.”
Perception on activities related to learning	Very helpful especially in learning language.	It is helpful when I am curious about something and I can go online immediately to look for the information.

Participant E, Male

According to participant E, he still prefers human-interaction during learning activities. The activities performed by participant E is still the same but the time spent is of a greater duration compared to two years ago. He prefers to use his desktop computer to perform all learning activities because the screen is big and he likes to be in a fixed location to perform his learning activities. It has been observed that participant E did not take the initiative to learn using his mobile devices as he has viewed that learning is an activity that involves teachers. From the observation, it has been found that the activities performed within these two years are entertainment-oriented activities such as reading news, using social networking sites for chatting and listening to music.

	2013 (17-year-old)	2015 (19-year-old)
Main purpose of using mobile devices	1. Read news 2. Use SNS (Social Networking Site) 3. Listening to music	1. Use SNS (for chatting) 2. Listening to music 3. Reading news

Reason for feeling uncomfortable when not having mobile devices	"I want to keep connected with my friends all the time."	"I feel "lost" without the mobile devices, especially my smartphone"
Perception on activities related to learning	"I preferred the learning activity to be stationed at a fixed location. Besides that, I found the screen size of mobile devices is too small to me"	"I still prefer to station at a fixed location to study due to the screen size."

Participant F, Female

Participant F stated that she was aware of her high level of mobile devices usage. She described this as an "addiction" and tried to control herself from using the mobile devices. She learns Thai language by using mobile apps. It can be observed that the learning activities are no longer consistent after two years for participant F. She just learns occasionally which is about thrice a week, at the maximum of 2 hours. The tablet is a better platform for her to perform the learning activities, because she claimed that the screen is bigger compared to her laptop and the device is lighter and easy to carry around.

	2013 (17-year-old)	2015 (19-year-old)
Main purpose of using mobile devices	1. For learning purpose 2. Reading news 3. Use SNS	1. Use SNS (for chatting) 2. Information searching 3. Reading news
Reason for feeling uncomfortable when not having mobile devices	Not feeling uncomfortable except if there is any emergency to contact someone	"You will be labelled as 'non-competitive' if you don't get connected. You may be missed out some important news and information. I need to be connected all of the time!"
Perception on activities related to learning	"Should be okay for me, but not for all subjects. Some subjects need hands-on practice which couldn't be replaced by simulation." For her, learning language is workable and much preferred.	"If I get distracted by other online activities, the learning outcome is actually zero!"

Discussion

Young teenagers are still fumbling and exploring technology devices. They are looking to the extent of which the technology devices could bring pleasure to them. From the study, it can be observed that some young teenagers' perspectives towards the mobile devices have changed from time to time. To use mobile devices for learning, young teenagers require a tutor to assist them in their learning process. Young teenagers are still teacher-dependent since they have been in school only for about 7 to 8 years. Self-directed learning needs time to be practiced and acquired by teenagers. On the other hand, motivation is also one of the factors for the teenagers to use technology in performing learning. If a teenager is not motivated, they will easily drift to other non learning sites.

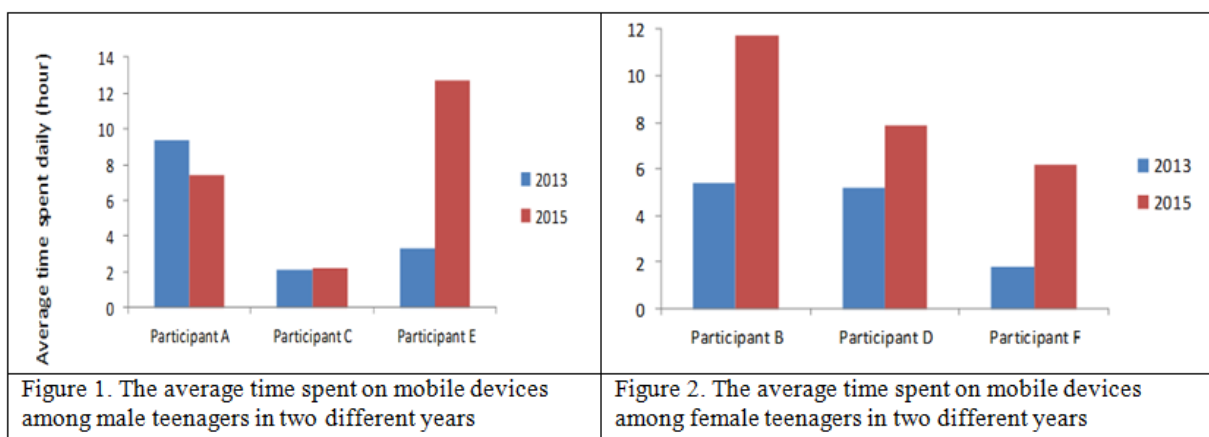
Comments on using mobile devices to perform learning:

Male participants have a slightly passive attitude towards the use of mobile devices in learning. They still insist that human interaction is the foundation of teaching and learning activities. One of the participants also claimed that the

learning process can be easily distracted by other interesting online sites. On the other hand, female participants think that mobile devices can fulfill their curiosity and they can get the answers online. They asserted that they have no problem using mobile devices to learn. In general, all participants posited that the learning will only take place when the topics of learning are interesting. The findings in this study are also likened to Wong's (2015) study which pointed out that the high number of participants used mobile devices for informal learning activities such as reading news, books, websites and watching videos.

Usage level

From the study, it has been observed that the time spent in using mobile devices has been increased drastically for female participants throughout the two years. In addition, the time spent in using mobile devices increased drastically for both older participants. Besides, the time spent on mobile devices has no significant differences between weekdays and weekends.



Conclusion

Generally, it has been found that the teenagers have a positive attitude towards using mobile devices for educational purposes due to its convenience; however, most of them did not use the mobile devices for learning consistently. The learning performed by them was done occasionally. Teenagers lack self-direction and need to be shown the advantages and the art of practicing ubiquitous learning by using the mobile devices. Mobile devices can be used by teenagers as an extensive tool in assisting both their formal and informal learning activities.

The volume of usage somehow maintained but the activities shifted from one to the other among the teenagers. Teenagers are great explorers. They did not keep the same interests for long but most of them “dug deep” into other type of interests in using their mobile devices. They had a tendency to look for newer and interesting sites and videos to keep themselves occupied.

On the other hand, the role of the teachers in schools was found irreplaceable by mobile devices according to male teenagers; however, female teenagers obtained some good learning experiences online and they claimed that those learning platforms are more attractive than the teachers at schools. This study suggests that mobile devices can be used to design short-span learning activities or apps for teenagers. Aspects such as engagement, usability and interestingness should be included in the study activities to prolong the teenager attachment to them.

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