

MOBILE PHONES AND GENDER. CHANCES AND CHALLENGES IN EDUCATION AROUND THE WORLD

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This article aims to report the perception of mobile devices – in particular mobile phones - and the impact on education. Mobile phones are common 21st century tools, offering functions as a storage medium, media player, navigation system, encyclopedia, digital camera, game console, appointment book, news portal and last but not least a communication platform. The study offers insights to the intersection of gender, mobile phones and education in different parts of the world. Mobile communication technologies have revolutionized social communication and chances for informal learning, especially in the developing world, with some influence on negotiating gender issues. Based on literature reviews issues of using mobile phones and the implications on gender and learning are discussed.

Keywords: Mobile Devices; Mobile Learning; Gender; Social Networks; Developing Countries.

1. Introduction

The use of technology that did not exist ten years ago allows for a degree of freedom and autonomy that has to be explored. Today many children and youngsters own mobile devices, especially smartphones, as basic media equipment (JIM 2013). They are used for communication, for procurement of information, to play, to create images and videos etc. Linkages between the devices being used outside of schools, and the technology to be found within schools, are often quite tenuous. Digital learning in the 21st century provides easy access to resources through application (apps), digital libraries and social networking. It engages students in ways that are fundamentally different from traditional instruction (Ito et al. 2008). Mobile devices are mostly used for self-directed informal learning rather than in the formal academic context. Mobile devices can provide a level of reach, scope and immediacy that is largely unattainable through traditional classroom environments (Huber & Ebner 2013).

2. Objectives of the research

The purpose of this study is to carry out conditions and perceptions of K12-students for using mobile phones with regard to informal learning. Informal learning doesn't happen at predetermined times. Learning doesn't happen at fixed locations: in fact, studies reveal that most learning happens in informal education environments. At its most basic level, technology is being used to cross the boundaries between formal in-school education and informal learning where students explore their own interests (Ito 2008, Clough et al. 2008). The mobile phone is the most prevalent mobile device according to recent K-12 survey-data from Project Tomorrow (Project Tomorrow 2014): 89 % of grade 9-12 students access a smartphone, 66 % a laptop and 39 % a tablet. (Grade 6-8: 73 % vs.66 % vs. 61 %. Tablets are often supported by the school).

The major research questions are:

What are the presuppositions for use of mobile phones in education: chances and challenges?

Is there an impact on gender while using mobile phones in education?

3. Intersection of gender, mobile technology and education

3.1 Digital divide

Prensky (2005) states that the present generation is a digital generation and its members are born with digital technology, thereby making them easily attracted to technologies regardless of gender. However, some social groups of young people appear to be just as digitally excluded as older generations (Prensky 2005). General academic literature on the Internet use suggests that even once people cross the initial connectivity divide, numerous differences affect how they incorporate the Internet into their lives, including level of education of the user and the user's parents, gender and ethnicity (Hargittai 2010).

Studies across Europe and North America show that levels of computer and Internet use are lower among rural youth, female youth and youth from families with low levels of parental education (Vandewater et al. 2007, Selwyn 2009).

The *London School of Economics and Political Science* (LSE) reveals on inequalities by age, gender and socioeconomic in relation to the quality in the take-up of online opportunities and social media among 9 - 19 years olds in UK. Their findings indicate that girls use the Internet in a greater variety of ways than boys at a younger age (9 - 15 years), but that boys make broader use of the Internet at an older age (16 - 19 years) (Livingstone & Helsper 2007). It is stated that boys, older children and middle class children all benefit from more and better quality access to the Internet than girls, younger and working class children. They argue going online is a staged process in which the benefits of Internet use depend not only on age, gender and socioeconomic status (SES) but also on amount of use and online expertise, e.g. skills and self-efficacy, shape and define the opportunities taken up by young people.

The vast majority of children at all grade levels in the developed world have access to mobile devices.

3.2 Children, young people, and online activities

Based on the findings of the *Speak up* Survey (based on participation of 403, 292 students, parents and educators in K-12 education) Riedel (2014) points out, that students are leveraging mobile devices both to be more efficient in their day-to-day tasks and to transform their own learning processes (Riedel 2014). Sixty percent of students are using mobile devices for anytime research, 43 % for educational games and 40 % for collaboration with their peers, 24 % for taking photos of their assignments, and 18 % for in-class polling.

The survey conducted by Ofcom shows detailed results (Ofcom 2013): among 8-11s schoolwork/homework is the most commonly-mentioned internet activity carried out at least weekly (75 %), followed by games (54 %) and information (45 %). 12-15 year olds are using their smartphones for a broad range of activities, where schoolwork/homework is the most commonly-mentioned internet activity (84 %), followed by information (79 %), social networking (68 %), and watching audiovisual content (68 %); they go online weekly for communication (66 %), for games (54 %) and for music (53 %). Most common is watching videos or clips posted by other people on sites like YouTube (50 %), sending/ receiving photos (38 %), posting photos or videos on sites like YouTube, Facebook or Instagram (33 %).

In the annual literacy study in UK (35,000 children, aged 8 - 16) surveyed pupils' writing habits. (Clark 2013) Technology-based formats, such as text messages (72 %) and messages on social networking sites (52 %) are figured out as the most commonly written outside of class by a large margin, followed by emails (46 %) and instant messages (45 %). Compared with boys, girls tend to write more technology-based formats.

A French research aimed to discover how teenagers and young people (14 - 25 years) use the symbolic properties of the mobile phone. (Batat 2009) Mobile phone is increasingly perceived as a multi-purpose device for teenagers, who feel comfortable with non-verbal ways of communication. Mobile

phones are being used in creative ways, for example for adding images to their personal websites or for creating short video clips. Batat refers to the mobile phone as a social device in the youth subculture: for both, girls and boys, a mobile phone is a symbol of independence, of belongingness and self-identity, “it is possible that teen mobile owners view their devices as extensions of themselves and their personalities”.

3.3 Mobile devices and gender

Goal 5 of the United Nations’ *Education for All* policy aims to provide equal opportunities for education, regardless of gender, by the year 2015. (UNESCO 2000) One of the greatest opportunities is to facilitate informal learning to complement formal schooling by using mobile devices. Features used are different among age and gender. Gender differences exist in use of social and web based media, consumption patterns, attitudes and affinity toward technology (UNESCO 2000).

Research on the use of media and digital devices, attitudes and understanding of children’s and young people (5 - 15 years) point to some gender differences (Ofcom 2013). “Boys like digital games and girls like talking”. Four in ten of the 12 - 15s with an active profile say they mostly use a mobile phone to visit their main social networking site profile. Girls are more likely to use their phone on a regular basis to listen to music and to take photos; they prefer uploading or sharing photos on a website. Activities more likely to have been undertaken by boys of this age are creating their own online game, producing and/ or sharing music or songs that they have composed or created themselves online. Not much gender differences were observed with other activities (Ofcom 2013).

A team from Alabama University surveyed about 1,000 students aged from 11 - 13 (Cotton et al. 2009). Boys scored higher than girls for using their mobile phones for sending emails, playing games, listening to music, and sharing pictures and videos. Boys are often taught to explore and be more creative with technology; they tend to use mobile devices as a gadget. Girls traditionally have perceived themselves as less skilled in terms of technology. It is argued that it has a lot to do with gender socialization. “If this perception continues, it can limit young girls. It can impact the types of jobs and courses that girls take’, hence it could lead to a different type of digital divide’. They point out that much has to be done to teach girls about the technical and more advanced multimedia features of their mobile devices” (Cotton et al. 2009).

This advice matches the findings of LSE, who recommend attention to the apparent drop-off in girls’ interest in exploring online opportunities by their mid-teens (Livingstone & Helsper 2007).

However research regarding gender differences in perceptions and acceptance of mobile learning found mixed results.

A survey in Denmark, Italy, Romania, the UK and Ireland in 2013, which involved 2,500 children aged 9 - 16 and their parents, refer to gender differences in the daily use of smartphones, which are very low within the single countries, notable difference are figured out when comparing the different countries (Mascheroni et al. 2014).

In higher education males show higher positive attitudes toward using technology for learning than females (You & Cheng 2012, Kahveci 2010; Li & Kirkup 2007).

Some other studies refer to a gender gap when comparing the use of computers, mobile devices and Internet. The gap is more prevalent in developing than developed countries. For example ITU estimates the gender gap in Internet usage by end of 2013 will be 11 % globally, with 2 % in developed countries and 16 % in developing countries (ITU 2013). The mobile phone gender gap is observed as a symptom of broader gender inequalities, apparent in education as well as in the general use and ownership of ICTs (UNESCO 2013).

3.4 Social Media

Evidence suggests that mobile phones are now an almost indispensable tool in the creation and maintenance of young people's social networks. The use is bound to their self-concept, both as a means of self-expression and as a way of socializing themselves. Today's kids are no longer passive media consumer. The shift toward social media means that kids can easily access, create, interact with, and share media messages about boys' and girls' roles. Most kids begin engaging regularly with cell phones and social network sites during early adolescence: Ninety percent of 13 - 17 year-olds are using some form of social media (Common Sense Media 2013).

This implies girls and boys come across gender stereotypes more than ever with the digital content they create and share with peers online.

Sixty-seven percent of the 12 - 15 year-olds have their own active profile, nearly all of them on Facebook (Ofcom 2013). The majority access their main social networking site profile every day, 27 % of them do so more than ten times a day, mainly on any type of mobile phone. Personal experience varies by gender: Girls are more likely than boys to feel under pressure to appear popular or attractive online. Girls are more likely than boys to say they know someone who has been bullied through a mobile phone (33 % vs. 20 %), have themselves experienced bullying in this way (12 % vs. 3 %) and to have experienced gossip being spread about them online or through texts (17 % vs. 10 %) (Ofcom 2013).

Through social and mobile media, teens provide one another with instant and impactful feedback on their appearance and self-expression, post comments, "like" photos, crafting their online image and tag friends with an online audience in mind. More teen girls text daily than boys (77 % vs. 60 %), photo posting is more a girls thing (75 % vs. 42 %) (Ofcom 2013).

Many teens can magnify feelings of judgment and popularity. This influences how kids and teens develop their identities, express themselves and socialize. Gender norms play a key role in shaping issues such as online hate speech, digital drama, cyberbullying, and sexting. Girls especially face double standards in the digital world.

4. The impact of mobile devices in education around the world

The most up-to-date content can be accessed immediately, from anywhere, and it can be repeatedly reviewed for better comprehension and understanding (UNESCO 2013). When it comes to mobile devices and education, most parents believe that mobile devices open up learning opportunities, benefit students' learning and can engage students in the classroom. Many parents also believe that mobiles and apps teach academic skills and content (Grunwald Associates 2013).

4.1 Learning with mobile devices - Mobile Learning

Traditional formal learning no longer comprises the majority of our learning. Learning at present is a continuous process and technology rewires our brains (Siemens 2004). Cell phones, eReaders and Tablets are not used in the same way as we use desktop or laptop computers. The type of learning that is appropriate on a mobile phone or smartphone is very different. Mobile phones are common 21st century tools. Most models are equipped with mobile processors that rival even full-sized desktop computers. They are a storage medium, media player, navigation system, encyclopedia, digital camera, game console, appointment book, news portal and a communication platform (JIM 2013). According to Barkham (2012) "it is not wise for schools that cannot afford modern ICT facilities to ignore powerful ICT gadgets in every pupil's pocket" (Barkham 2012).

Using mobile devices for educational purposes is becoming a common expectation of learners (Lan & Huang 2012). "Smartphones are already used extensively in an informal learning context by enthusiasts" (Clough et al 2008). Bachmair (2011) refers to the importance of the assimilation of

learning in informal contexts of everyday life in which students act as naïve native experts. “Mobile devices lend themselves to situated learning, which is often militated against by the fossilized practices of schools. Mobile devices support the notion of learning as meaning-making and they bring into play the life worlds of students and create contexts that lend themselves to replacing the passive transfer of knowledge, which is still in the foreground in the approaches to teaching and learning in many schools” (Bachmair et al. 2011).

Getting kids engaged with learning, focused on “working smarter and ready for the future”, one way could be to help them by incorporating gadgets they’re already familiar with into their learning environment, namely the mobile phone.

More than half of parents believe that schools should make more use of mobile devices in education and look to teachers and schools for guidance on helping children use mobiles and apps for educational purposes (Grunwald Associates 2013).

There are some concerns about mobile devices in the classroom. Many schools have prohibited students from bringing their own cell phones or electronic devices in general (“Bring your own device”, BYOD) to class, arguing that they distract from schoolwork. Students seem to be powering down their devices in the classroom, or using them under the radar. This could be a signal that technology that can move between homes and schools could become essential for academic learning. With careful introduction they can engage students in new learning activities in a classroom setting. An example for a forward strategy can be investigated in Illinois and New Hampshire, where state-level initiatives that focus on mobile learning are already implemented (UNESCO 2013).

Klopfer (2008) argues that mobile learning games are not only engaging, but can also account for the user’s context and environment to improve on the learning process (Klopfer 2008).

Mobile technology offers ubiquitous wireless technology for learners and educators and provides instructional materials and interaction among educators and learners wherever they are. Mobile learning enables communication in the learning community and supports users with expertise over a range of features. Owning a mobile phone is not an assurance that students will use mobile phones for learning purposes. This places a higher burden on educators to rethink the role and types of strategies applied in “formal” education, especially when engaging the minds of digital learners. Educators should emphasize how the features are integrated in the learning environment. Context and usage scenarios are key areas.

It can bring great revolution and development in education if mobile phones are properly integrated and used in teaching and learning setting.

4.2 Cell phones and developing countries

Schools all over the world are challenged to prepare their students for a global 21st century marketplace, which needs to teach 21st century skills (e.g. self-directed and collaborative learning) (Norris 2011: 20).

For most people living in developing countries, cellphones are the only computing technology they know and have access to. This makes mobile phones a potential alternative for computer-supported learning. The cellphone has been argued to be an appropriate device for educational delivery in the so-called developing world (Brown 2003, Kam et al. 2009). Cellphones have the potential to improve education for millions of underprivileged users; it is set to become a catalyst for narrowing the digital divide in developing countries. The cell phone has the potential to provide an alternative access and participation mechanism for those who have previously been “digitally excluded” (Ford & Botha 2009). Mobile phones are increasingly affordable for women and girls in developing countries, offer additional freedom in deciding when and where to use them for learning, and can provide on-demand access to voice- and text-based instructional materials. It is argued that they are a perfect vehicle for

making educational opportunities accessible to rural girls in places and times that are more convenient than formal schooling (Kumar et al, 2010). Mobile phones are an attractive and affordable means to maintain literacy skills, to obtain information, and hold great potential for reaching marginalized girls and women by providing them access to further learning and development. “Making girls and women wait for access to education when mobile phones are available (or becoming available) to them could be one of the greatest missed opportunities in the coming decade” (Zelezny-Green 2013).

4.3 Examples from different countries: Mobile phones and learning

It is important to consider the use of mobile phones as potential learning tools because the devices do not permanently depend on electricity connection, are easy to maintain, easy to use audio and text interfaces, affordable and accessible (Valk 2010). In Peru, efforts have been made to enhance the use of mobile phones in formal education (Barkham & Moss 2012).

An international comparison provides a detailed picture of children’s (8-18 years) mobile phone behavior and gender differences across five countries: Japan, India, Indonesia, Egypt and Chile (GSMA 2013). Gender differences were found with boys’ higher use than girls in Indonesia, India and Egypt, the opposite was figured out in Japan and Chile. Entertainment apps are most popular among all ages, - while use declines as children get older-, followed by education and learning apps. A gender difference was found with girls using health apps considerably more than boys. No gender difference was found when examining confidence and insecurity.

Adoption of mobile phones and gender differences in using multimedia features in classroom settings were explored in Panama in 4th, 5th and 6th graders (Valderrama-Bahamondez 2011). Observations suggest that boys are faster to adopt the mobile phones and explore more functionality, while girls take more time to familiarize themselves with the phones. Boys seemed to be more distracted than their female peers while working on assignments on the phone (boys explored other applications during an instructed task). Girls seem to maintain a better focus on the learning activities using the mobile phones. These findings suggest that it is important to consider the different adoption and exploration strategies of girls and boys with new technologies when designing tools for mobile learning.

The impact of gender on learner’s participation, motivation and achievement in mobile game based learning (GBL) in fourth graders (9- 10 years) in Taiwan was investigated on the topic of science observation in a virtual ecological pond. The findings show that girls ask fewer questions and speak less than boys in both the traditional classroom and outdoor learning. However, no gender difference was observed in achievements and motivation. Thus, integrating mobile technologies and game design into classroom instruction may reduce the gender gap in learning participation in a traditional classroom environment. Boys exceeded girls in self-confidence pertaining to mobile technology use (Jung-Chuan Yen 2011).

Mobile learning projects from the Philippines, Mongolia, Thailand, India and Bangladesh indicate that mobile learning enhances educational outcome.

In developing countries, the greatest opportunity is to facilitate informal learning in out-of-school environments to complement formal schooling: The Jokko Initiative (Senegal), Project ABC (Niger), the Somali Youth Livelihoods Project (Somalia), Nokia Life Tools (Nigeria), and M4Girls (South Africa) are interventions that used mobile devices to teach literacy, numeracy, maths and/or employability skills and provide learning opportunities for people, often primarily of the female gender, who may not otherwise receive this instruction (Zelezny-Green 2012).

In India the feasibility of mobile learning in out-of-school settings in rural, underdeveloped areas was examined. Cellphones were used in a project for making educational opportunities accessible to rural children (7-18 years) that are more convenient than formal schooling, by offering them access to mobile content (Kumar et al 2010). The cellphones were pre-loaded with applications that target

English as a Second Language, an important “gateway” to economic advancement in India. The extent to which rural children voluntarily engaged in mobile learning when they are unsupervised was investigated. Results show a reasonable level of academic learning and motivation. Finally it was found that gender attitudes remain a significant challenge.

In Pakistan the Mobilink project, a basic literacy program, - was conducted. 250 girls (15-24 years) living in rural areas of the Punjab were provided with a mobile device in order to improve their English language skills by receiving daily SMS (Mobilink GSMA 2013). It was based on SMS messages to maintain and improve participants’ literacy, with six messages a day on a variety of topics including religion, health and nutrition. The girls were expected to practice reading and writing down the messages and responding to their teachers via SMS. While at the beginning considerable resistance was encountered on the part of parents and community leaders to the idea of allowing girls to have mobile phones, exams taken by the girls showed striking early gains in literacy.

Ronda Zelezny-Green, an expert on gender and mobile learning in Africa, says that girls are one of the most marginalized segments of Kenyan society. (<http://rondazg.com/mlearning-in-kenya-interview-on-my-research-objectives/>) Early pregnancy and the expectation that they will stay at home to care for relatives makes attending school more difficult for girls than for boys. Learning activities of girls outside school by using mobile phones hold promise for them with better conditions, especially with regard to life skills, health care and personal development.

5. Discussion

New technology brings new chances and risks for children and young people and implies various effects on education.

5.1 Chances and challenges

Mobile phone adoption enables direct access to multiple applications. They offer a number of advantages and indicate great potential as learning tools, depending on its proper use. Teens prefer using their mobile devices to going online.

Because the Internet makes things more transparent and people can post anonymously, kids may come across extreme messages about gender roles that they may not be exposed to in their everyday lives (cyber mobbing, sexting). The deeper media messages are embedded in young people’s social media lives, the more important it becomes to teach them how to recognize gender biases and empower them to challenge harmful stereotypes. Each child should be appropriately educated to be aware of the dangers in the virtual environment and should know the basic self-protection techniques. With Social Networks they can make an effort to not perpetuate gender stereotypes in the videos, images, comments, and messages that they share.

Games and media applications can play an important role in introducing new functions. On the other hand, such applications can distract the actual learning process.

However, owning a mobile phone does not necessarily assure that students use the device for learning purposes.

Challenges can be identified in the opinion that mobile phones in classrooms are “bad” (distracting, disruptive). Today’s youth is the mobile phone generation, but most of the schools ban mobile phones from the classroom. While most of the pupils in the developed world grow up using their smartphones as an everyday device, teachers are mainly not familiar with the universality of technologies.

The effective use of mobile phones depends much on internalized moral values of individual student rather than forcing them through rules and regulations which prohibit students from accessing mobile phones. Country of residence and smartphone ownership seems to have a larger effect on chances for access to applications for learning (formal and informal) than gender.

5.2 Gender

Young people are spending most of their time on Internet related activities, playing games and listening to music, however there are notable gender differences in activities (texting, gaming, photo sharing etc.). Gender differences can be observed depending on age, the area where they live, context and usage scenario. Boys are more active in free exploration and learning new applications - games in particular. They discover the basic functions of the phone faster. Girls are more focused on the learning task, but may be accidentally interrupted by problems in operating the device. However, research on using smartphones to support different learning tasks did not show significant differences by gender (Evans 2013).

The increasing adoption of mobile devices could help girls break through the misconception of technology as a “male thing”. While it is a common assumption that using computers is a male dominant activity, the use of mobile devices does not show similar gender differences. Both genders love those gadgets, but parents and teachers do not point out that girls as well as boys can create sophisticated applications with them. The notion of boys being more tech-savvy than girls seems a misconception. It restricts girls internally from entering a more technological way of life as they grow. To leverage the meaning that girls may not see themselves as technical, but love their smartphones, they can tap into technology with their gadgets and increase their confidence in technology. Getting to know technology doesn't necessarily mean that one needs to know things like computer programming. Constant encouragement and exposure to smart phones can open girls' minds to pursue and support their technical knowledge.

To open new doors for creativity there are ICT enrichment programs for teens in UK. An example for mobile tech initiatives “Apps for Good,, promotes creative learning programs to build skills and confidence of young people aspiring to become technology experts. (<http://www.appsforgood.org/>) The programs center on mobile app development for smartphones and tablets and can create compelling educational and engaging environments for learners.

Finally challenges observed in education in developing countries need similar research in the developed world with regard to children from marginalized groups, particularly girls and immigrants, who live in extreme poverty, in slums, in remote communities, or are from ethnic minorities.

6. Conclusions

This study explores the effects of the evidence of mobile phones on formal and informal learning. The findings reported suggest that mobile phones have the potential to provide new learning experiences. Different goals are addressed when discussing advantages of mobile phones for learning purpose in different parts of the world.

Mobile technology has become one of the emerging technologies in the world, with mobile phones as an integral part of the life of students regardless of their gender. Applications offer fun, engaging ways of learning, connecting, communicating and readiness to use mobile phones productively. The proliferation of mobile technology provides uncountable opportunities to support learning and performance both inside and outside school with devices young people already own. Although many students know that smart phones are integrated with applications, including computing and communication, they seldom use them for learning purposes.

Mobile technologies are changing the way students learn: playing complex video games, interacting with simulations that put them in challenging situations and more. Mobile learning games can act as a unique and powerful tool within educational technology (Klopfer 2008).

While mobile technology is not and never will be an educational panacea, it is a powerful and often overlooked tool that can support education in ways not possible before.

Teachers should remember the technological demands of mobile devices when planning activities in order to give the activities a valuable pedagogical component.

Education and gender equality benefit from high mobile technology prevalence. The characteristics of mobile phones, when leveraged appropriately, can help increase gender equality in education. The educational system has to be adapted to today's and tomorrow's technologies which can break up role stereotypes and – to some extent – overcome gender inequalities. Furthermore mobile learning could empower to engage in lifelong learning.

However children need help to assess potential risks and unintended consequences of their media use. Children must be trained to take advantage of the opportunities presented by modern technologies.

However it is important to continue on the topic with deeper research on the intersections of mobile phones and the appropriate use in learning and teaching.

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