

# SCHOOL CULTURE FOR THE MOBILE DIGITAL AGE

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## Abstract

School culture is a nebulous blend of traditions, values, beliefs, and rituals built up over time. Recent mobile technologies are disrupting this culture in favor of learning that is personalized, on demand, ubiquitous knowledge. This paper provides a historical overview of the adoption of mobile technologies in school culture. An epistemological dissonance is uncovered regarding a slow rate of adoption and effective pedagogical practices. Finally, building from existing literature, a new framework is presented to elucidate a new school culture that involves students as curators of the web, creators of knowledge, and custodians of learning.

## Keywords

Mobile, mobile learning, m-learning, technology, culture, school culture, beliefs, values, traditions

## 1. School Culture for the Mobile Digital Age

School culture is a nebulous blend of traditions, values, beliefs, and rituals built up over time. It is all encompassing, yet elusive and often difficult to interpret. Nonetheless, school culture determines the attitudes, beliefs, decisions, and actions of teachers. For example, school culture includes, pedagogies (Hodkinson et al., 2005), relationships (Fullan, 2001), what staff talk about in the faculty lounge (Kottler, 1997) and willingness to change (Hargreaves, 1997). When new ideas and changes are added to school culture, this causes ripples causing teachers attitudes, beliefs, decisions, and actions to be challenged. Arguably, one factor that has caused the greatest ripples in the past 100 years is technology. Since digital technologies emerged in general society, schools are relatively slow at adopting these new technologies (Bruce, 1993; Cuban, 2001; Harrison et al., 2004; Johnson et al., 1994).

For a long time, philosophers, scholars and governments argued of the benefits and negatives for the inclusion of technology into the educational system. For example, Thomas Edison thought that movies would be the end of text books. «Books will soon be obsolete in the public schools. Scholars will be instructed through the eye. It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed inside of ten years» (Master Needham, 1912).

In the past decade, societies global adoption of mobile devices (e.g., mobile phones, PDAs, and tablets) are causing a unique challenge for school culture. These devices have caused polar opposite policies to be placed on school educators, going from a blanket ban to an open arm adoption and bring-your-own-device policy. The very mobility, cost, and size of the mobile technologies is both a threat, as they can be smuggled into schools by students unnoticed, and a benefit as they offer unique pedagogical opportunities. In this paper, the struggle between school culture and mobile technologies is unpacked to finally reveal a new culture in schools and a new model of learning.

### 1.1 Brief History of Digital Educational Technology

Digital technologies started appearing in many schools in the 1980 predominantly as desktop computers, typically one per classroom, and during the early 1990's laptops started to emerge (Crompton, 2013a). Various handheld computers were developed in the 1980's, although it was not until the 1990's that they were used in the educational setting (Crompton, 2013a). In 1983, Lesgold described the end of the first phase of the computer revolution as computers arrived in the schools. He then described the second phase as the challenge of deciding how they were going to be used. Lesgold possibly thought this was an event only

happening once, but digital technologies have continued to emerge causing an iterative phase one and two occurrence.

Up until the introduction of mobile digital technologies, it can be argued that previous technologies impacted school culture around the margins. This may seem a strange comment given the invention of the Internet that has globally brought about a new digital epoch. The advent of the Internet is arguably as momentous as the creation of the Gutenberg Printing Press in the 15<sup>th</sup> Century. These are two of the most significant periods in time that have opened opportunities for information to be accessible to all. Nonetheless, the majority of school-aged students during the typical school day did not have access to the Internet. Typical school models have been classrooms with a small bank of three or four computers, or once a week access to the computer lab. In these situations, student access to the Internet – to information, was controlled by the teacher giving access to the students.

Education has long been conceived as classroom-based and predominantly sedentary (Merchant, 2012). With the advent of mobile devices, students have the potential to access information at any-time and anywhere during the school day. Students are no longer dependent on fixed resources such as the computer lab, teachers, and/or libraries for access to information. This «independence» is challenging school culture in a number of ways.

## 1.2 Affordances made possible by mobile digital technologies

To best understand this challenge, it is necessary to recognize the unique affordances of mobile technologies that can be used in learning. The introduction of ubiquitous mobile devices mean that students are no longer tethered to specific learning resources. With wired mobile devices, students can access information anywhere and anytime. In addition to being ubiquitously connected to learning resources, mobile digital technologies provide students with multi-media tools, connectivity tools, capture tools, representational tools and analytical tools (Churchill and Churchill, 2008). These tools provide expanded communication and learning beyond the written and static spoken word to include video, instant messaging, podcasts, movie making, real-time face to face communication, and multi-media animation. These multi-faceted affordances allow students to not only become receivers of knowledge, but creators and curators as well (Kukulska-Hulme, 2010) creating an epistemological change in the nature of knowing and knowledge. During the school day, students can transform how knowledge is produced, owned, shared, stored, valued, transmitted and consumed (Royle et al., 2014). This is a huge cultural shift in the learning process moving from the passive receiver model.

When computers were introduced to schools, these technologies were accepted and even welcomed by most educators (Bonds-Raacke and Raacke, 2005). These earlier forms of technology served or serviced the dominant conceptions of the role and purpose of education (Traxler, 2013). They were seen as tools in which both adults and students could have increased efficiency and effectiveness. This was the case as long as the adults in the school controlled access to this form of digital technology. However, once mobile digital technologies began to become available and they provided more freedom for students, schools resisted their use. For example, as recently as 2012 Sir Michael Wilshaw, the chief inspector of schools in England, called for mobile phones to be restricted in schools (Clark, 2012). Unlike other computing technologies, mobile devices enlarge students' range of action and thought (Royle et al., 2014). Up until the January of 2015, New York City schools had policies that banned students from bringing their cell phones into the school. This led to the development of a cottage industry in which students paid a dollar a day to a vendor positioned outside the school to hold their phone. They could retrieve their mobile devices at the end of the school day and rejoin the world of 24-7 learning (Yang, 2015). Inside the school, however, things proceeded as usual, with perhaps a weekly trip to the stationary computer lab.

## 2. School Culture and Mobile Digital Technologies

Culture is a blend of traditions, values, beliefs, and rituals built up over time. To analyse a culture's espoused values, it is important to take a step back and analyse the basic underlying assumptions of these values. Schein (Schein, 1992) identifies these assumptions as a complex set of shared tacit understandings about the nature of things and the best way to handle situations and challenges that occur in an organization. The behaviors and actions of schools as organizations are underpinned by a variety of assumptions that are often taken for granted and not in the consciousness of the members of that schools' culture.

Investigating the underlying assumptions about the nature of schools and learning can help to elucidate the reasons for the struggle between school culture and mobile technologies. Finnán (Finnan, 2000) identified five underlying assumptions that influence the success or failure of reform implementation:

- assumptions about adults roles and responsibilities;
- assumptions adults hold for students;
- assumptions about best practices and structures for educating students;

- assumptions about leadership and decision-making;
- assumptions about the value of change (p. 9).

In this paper, Finnan's assumptions formed the framework of analysis as the five corresponding questions were asked:

- what are the roles and responsibilities of the teacher?
- what are the roles and responsibilities of the student?
- what are best practices and structures for educating students?
- who provides leadership and who makes the decisions?
- what is the value of change?

## 2.1 Teacher and Student Roles and Responsibilities

Prior to the adoption of mobile devices in schools, during the school day, teachers, textbooks, and an occasional visit to the shared desktop computer were students' primary sources of information. Not only were teachers one of the primary sources of information, teachers were also the primary deciders of what should be learned. Berge (Berge, 2013) calls this just-in-case learning. Students learn knowledge or skills as directed by their teacher, just in case they may need them later. The introduction of mobile technologies into the school creates a significant cultural shift as students have access to just-in-time learning with the opportunity to access information when they need it. As Seymour Papert postulated, «You can't teach people everything they need to know. The best you can do is to position them where they can find what they need to know when they need know it» (e-Learning Centre, 2005). Norris and Soloway (Norris et al., 2011) explain the shift in teacher roles and responsibilities as one of i-teach to one of we-learn, where students and teachers work together to learn and grow. Mobile digital technologies require teachers to become more flexible, willing to tolerate ambiguity and willing to experiment with how these technologies can be used to teach their subject matter (Mishra et al., 2009).

With the teachers' monopoly on knowledge removed, students are no longer just passive receivers of information, but hold a great wealth of information in the palm of their hands. Teachers still structure the learning activities during the school day, but those who utilize the affordances of mobile devices provide students with choices about what they consider relevant and meaningful. As the students control their learning, metacognitive skills are developed and students start managing their own executive learning processes (Cinque, 2013). When students have the power to choose what they want to learn and when they want to learn it, Berge calls this just-for-me learning (Berge, 2013). The students become the focus of the learning, partnering and collaborating with teachers and peers in the learning process (Lahiri and Moseley, 2012).

In essence, with mobile devices, the student has a much greater opportunity to take charge of his or her own learning. The prospect is available for the student to become active, autonomous and self-directed. However, just because the opportunity exists does not mean that the student will self-actualize in this way. The lesson activity must be designed in such a way as to allow students to have some autonomy and choice. Mobile devices are just the tools, it is the teachers' role to become a change agent and enable this to happen. The role of the teacher then shifts from one of authority figure to one of facilitator and supporter of the student's growth in becoming a responsible and successful learner (Dede, 2010).

## 2.2 Best Practices and Structures

Mobile technologies present a need for change to school structure and educational practices. Pedagogies used in many schools are those designed for the industrial era and are not appropriate for this digital age (Mehta, 2013). Schools have been structured around a factory model with students tethered to desks and teachers isolated in their classrooms. Mobile digital technologies have a destabilizing effect on this structure, as they begin to open up possibilities for different kinds of learning relationships, different kinds of interactions and different genres and communication purposes (Merchant, 2012). As philosophies and practice move toward learner-centered pedagogies, technology, in a parallel move, is now able to provide new affordances to the learner, such as learning that is personalized, contextualized, and unrestricted by temporal and spatial constraints (Crompton, 2013a). Mobile digital technologies allow learning to expand beyond the four walls of the classroom (Dede et al., 2010).

The educational practices that are embedded in school culture are based on assumptions about the nature of teaching and learning. Mobile digital technologies challenge the long standing dominant direct-instruction model used in schools (Norris and Soloway, 2015). The affordances allowed by mobile devices call for different pedagogical models to gain prominence in school educational practices. These models are student-centric based on the individual student's learning expectations, styles, interests, and abilities (Obisat and Hattab, 2009). The educational practices move from a direct-instruction, memorization-oriented pedagogy to an inquiry, question-asking, and conversing pedagogy (Norris and Soloway, 2013). This allows teachers to plan for the diversity in students' needs, use authentic learning activities, and reward individual performance (Berge, 2013). This shift in culture around educational practices requires teachers to acquire specific knowledge about how mobile digital technologies can be used as effective pedagogical tools in their subject areas (Mishra et al., 2009). Teachers need to be open



to how teaching and learning can be enhanced or transformed through the use of mobile digital technologies (Merchant, 2009). They also need to embrace digital mobile technologies as essential tools as opposed to supplemental tools if the true potential of these technologies is to be realized (Norris et al., 2011).

Halverson and Smith (2010) express the potential of learning technologies at two levels: technologies for learning and technologies for learners. In the former, the designers/teachers select learning goals and use the technologies to best guide students toward these goals. In the latter, the technologies allow users to select learning goals and to choose the means that will best achieve their goals. Mobile digital technologies are technologies for learners. The educational practices needed to insure that mobile devices are used as technologies for learners include insuring that the focus is on learners, allowing them to partner and collaborate with teachers and peers (Lahiri and Moseley, 2012).

### 2.3 Leadership and Decision-Making

Leadership and decision making patterns in schools are challenged with the introduction of digital mobile technologies. How, when, where, and what should be learned is regulated by national, state, district, and teacher control (Berge, 2013). Schools are hierarchical with a pyramidal structure of power, privilege and access to information (Hodas, 1996). It is beyond the scope and space of this paper to discuss national, state, and district influence on school culture. Furthermore, it is typically beyond the power of those working in a school to change these outside influences. Nonetheless, changes to school culture can be made by individuals in the school, and particularly school leaders.

School leaders can adopt the facilitator role in allowing teachers some autonomy to make decisions, for example, how to teach a particular concept using a different approach than working from textbooks. Schools traditionally have adopted technologies that reinforce institutionalized priorities (Halverson and Smith, 2010). Traditional, classroom-based, in-person education uses a model in which technology simply supplements teacher-controlled curriculum and activities (Keegan, 2002). When mobile initiatives, such as BYOD, are introduced into schools, decision-making capabilities can change. As schools no longer procure, police and maintain the devices that students own there is a huge shift in agency, control and authority within schools (Traxler, 2010).

Growing school accountability efforts create a tension regarding who provides the leadership and who makes the decisions in schools around the use of mobile devices. At the same time that mobile technologies allow students to become more autonomous and self-directed, schools are dealing with standards-based teaching and high-stakes assessment that are not in control of the learner (Bracey, 2007; Halverson and Smith,

2010). This conflict between the ability of the student to use the mobile technology to control his/her own learning and the required achievement on school decided outcomes can cause considerable tension.

## 2.4 Value of Change

As schools are vested with the important role of educating the next generation of a country's citizens, they are by their nature cautious in embracing change without evidence of the benefits of the change. New technologies are considered beneficial if they increase learning and motivation (Graesser, 2013). For schools to embrace mobile technologies, there needs to be evidence that this happens. The challenge in this regard is caused in part by the limited and insufficient research base around the use of mobile technologies. Accounts of success overwhelmingly outnumber accounts of failure; however, the evidence and evaluations are not always rigorous and credible (Traxler and Kukulska-Hulme, 2005). The nascent research base regarding mobile technologies creates tension between those in schools who say «just do it» (Stead, 2006) and laggards (Rogers, 2003).

The affordances provided by mobile digital technologies allow students to develop the skills deemed important for 21st century learners. The Partnership for 21st Century Skills 2009, a U.S. organization, has developed a unified, collective vision for learning known as the Framework for 21st Century Learning. This framework describes the skills, knowledge, and expertise that students need to master to be successful in future college and careers. Two of the most important skills highlighted as important for 21st Century learners are:

- learning and innovation: creativity, critical thinking, problem-solving, communication and collaboration;
- life and Career: flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility.

Most of the mobile technologies used today are highly interactive and enable teachers to create learning environments in which students can learn by interacting with the environment, collaborating with peers and others, receiving timely feedback and encouragement to refined their understanding and creating new knowledge (Lahiri and Mosely 2012). These learning environments facilitate the growth of essential skills for today's students.

This call for the development of 21st century learners is not limited to the US. Many similar initiatives are appearing across the globe. For example, the Singapore Ministry of Education has called for a change in their schools recognizing that their direct-instruction pedagogy with its



emphasis on memorization, while producing good test-takers, is not producing the entrepreneurial, imaginative, innovative thinkers that the government thinks is important for Singapore's continued growth (Norris and Soloway, 2013). The Ministry's Master Plan calls for a change to inquiry pedagogy, with an emphasis on the 21st Century skills of self-directed learning and collaborative learning. Development of these skills is facilitated by the use of mobile digital technologies (e.g. Norris and Soloway, 2013).

In addition to support for change within the educational community, there is a significant impetus to support the use of mobile digital technologies in schools from the corporate world. The corporate world has embraced the use of mobile learning as a major delivery system for providing training and performance support. Major corporations such as Verizon, Merrill Lynch, Sun Learning Systems, Chrysler, Microsoft, and 3Com, Homewood Suites by Hilton, National Semiconductor, Capital One, Siemens and Valero Energy have major projects related to mobile learning (Lahiri and Moseley, 2012). As students graduate from schools, they will be joining a work force in which they are expected to be lifelong, self-regulated learners using mobile digital technologies to maintain and enhance their professional skills.

Finally, mobile digital technologies continue to change our daily activities and how we perform them. In today's world, people use mobile devices to communicate and collaborate, monitor and manage health, engage in commerce, play games, manage money, listen to music, and access information about any topic, anytime, anywhere. In 2014, 71% of people in the U.S. own a smartphone and 38% own a tablet (Fulgoni, 2015). A survey shows that 89% of China's online traffic comes from mobile devices (Kemp, 2015). If mobile digital technologies are central part of students' activity and learning outside of school, they should not need to power down before coming into school, but school culture needs to shift to accommodate for these new affordances.

### 3. Framework for School Culture in the Mobile Digital Age

In this paper, a tension has been described between assumptions that define the culture of a school and the new pedagogical affordances of mobile learning. In this section of the paper, a new framework is presented to show what school culture, as defined by Finn's (Finnan, 2000) assumptions, would look like if mobile devices are used to the full potential during the school day. This framework works on the assumption that the school stakeholders, teachers, school leaders, and students, understand the value of mobile learning and are willing to implement

mobile learning into the school day. A diagrammatic representation of the framework for school culture in the mobile digital age is presented in figure 1.

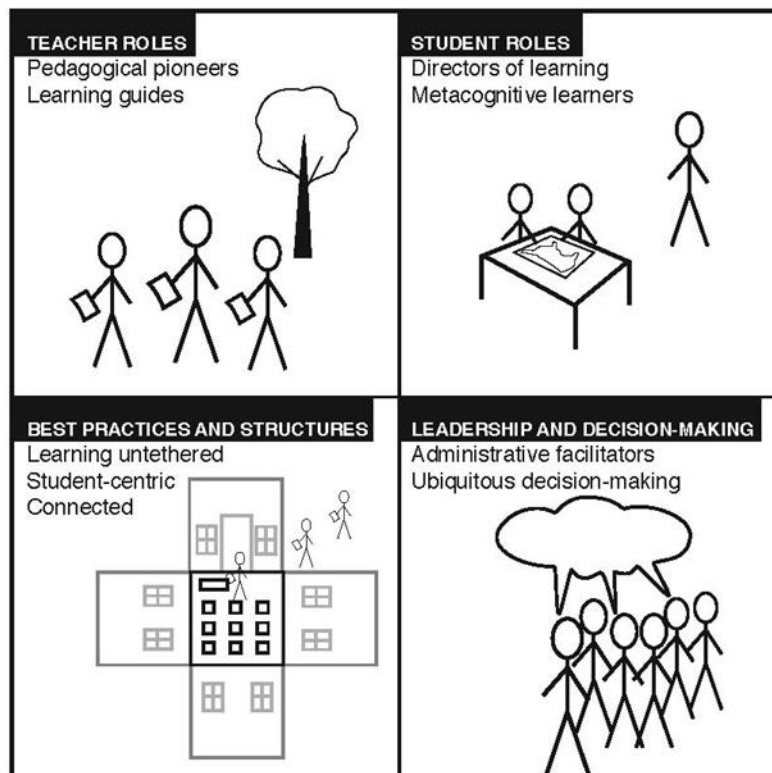


Fig. 1. School culture in the mobile digital age

In the top left quadrant the adult roles are described as pedagogical pioneers and learning guides. Teachers are pedagogical pioneers as they extend beyond the boundaries of traditional pedagogies to match empirically substantiated best practices with actual classroom practice. For example, many students who struggle with science concepts show competence in out-of-school contexts (McLaughlin Irby and Langman, 2001), therefore, the teacher will use the affordances provided by the mobility of the devices to take the students out of the classroom to these local environments. The term pioneer was selected as the affordances of mobile devices are continually growing, therefore the teacher will continue to explore new opportunities to extend and enhance students' understandings.

During the learning activity, the teacher acts as a learning guide to encourage students to: think for themselves; support students if they have misconceptions or errors in thinking; and extend students thinking. This teacher has planned the lesson carefully to ensure that students have

choices regarding their learning, that they are required to think and not just follow directions. For example, students may have a choice of the mobile application and the method to demonstrate understanding.

In the top right quadrant the student roles are described as directors of learning and metacognitive learners. As teachers have provided students with choices in learning, the students then direct what they are going to do to accomplish the task and how they are going to do it. They are no longer just following step-by-step directions selected by the teacher. They are instead choosing their own learning paths. As students become directors of learning, they also become metacognitive learners as they have to think about how they learn best and strategies to take to do that. They become active and self-directed learners. This corresponds with Freire's (Freire, 1993) model of critical consciousness and Maxine Greene (1976) as she described the students «learning to think otherwise».

In this framework of school culture in the mobile digital age, the bottom left quadrant, describes best practices and structures as learning untethered, student-centric, and connected. Learning untethered is a fundamental characterization of mobile learning as students are untethered from the classroom, untethered from the teacher to become self-directed learners, and untethered from time as learning can happen during breaks, lunchtime and other unstructured times during the school day. Moving towards a student-centric form of learning is not a new concept with advocates, such as John Dewey in the 1900s (Yonezawa, 2014). What is new is the different ways of personalizing the learning afforded by the use of mobile devices (Crompton, 2013b). Personalizing learning demands adaptive, creative, problem solvers (Zmunda et al., 2015).

As school culture becomes mobile and digital, students are connected to information and people. As aforementioned, students with access to mobile devices are connected to information via the Internet. Students are also connected with others at a global level and at a local level. For global example, students learning about ecosystems may come across an unfamiliar creature in their local environment. They could take a photograph and upload to the website iSpot to have experts connect with the students to identify the species. For a local example, students in the same class may be collaborating in creating a list of local wildlife as they complete a Google Form that uploads to a shared Excel document.

In the final quadrant, leadership and decision-making would transform to be administrator facilitators and ubiquitous decision-making. Administrators in schools (e.g., principals head teachers), who hold a position of responsibility over other staff members, will provide opportunities for the other people to be self-regulated. This is similar to the role of the teacher changing to learning guides as the administration in the building will encourage and provide opportunities for teachers to be

pedagogical pioneers. Decision-making will be ubiquitous as administrators empower teachers and teachers empower learners. This is a will encourage thinking as a habit from all school stakeholders.

#### 4. Conclusion

School culture is a nebulous blend of traditions, values, beliefs, and rituals built up over time; a list of confounding variables that cannot be controlled for. Nonetheless, to best review that culture Finnan's (Finnan, 2000) assumptions provided us with a framework to ask questions about roles, decision making and other factors that can provide 'observable' evidence. Observable in that these changes can be visually evident in behaviors enacted in school. Technologies have progressed at an increasingly rapid rate. To take advantage of the technological tools requires a change in traditional school culture. In this paper, a framework is presented of a school culture in the mobile digital age. This reveals the adult and student roles, best practices, structures, leadership and decision-making in a school taking advantages of mobile learning. Adults become learning guides and pedagogical pioneers, students become directors of learning and metacognitive learners. Learning becomes untethered, student-centric, and connected in best practices and structures and leadership and decision-making has all stakeholders making decisions and administrative facilitators empowering teachers, as teachers empower students.

This paper provides a general overview of school culture. Future research could go into more depth by exploring each of Finnan's (Finnan, 2000) assumptions separately. This paper was intended to explore the larger overarching school culture. It would be useful if sub-categories were explored such as the learning culture, which Kukulska-Hulme (Kukulska-Hulme, 2010) described as the pedagogical aspect of what we know about how students learn. This paper provides researchers, scholars, and practitioners a springboard for future studies and lines of enquiry.

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