
Wireless, but Cell-Less: A Study of Attitudes towards Cell Phones in the Classroom

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Abstract

As mobile technology establishes its dominating presence in all spheres of modern life, CALL research is increasingly concerned about effectively tapping into the unlimited potential of mobile electronic tools in education. The current situation with mobile phones as teaching and learning tools is rather complicated in the educational milieu, ranging from official prohibition, to teachers' apprehension and rejection of cell phones in the classroom, to unreserved appreciation by all parties, as the only electronic tool available to students. This article reflects the results of research done within the framework of the NUCB MEXT project on attitudes of students and teachers toward mobile phones as educational tools. Specifically, it reports on the results of a survey conducted at NUCB in 2011 on the ways students and faculty use their cell phones, their general cognizance of technology, teachers' propensity to innovate with cell phones and respondents' beliefs about the appropriateness of this technology in an educational setting.

Introduction

Mobile technology has firmly established its ubiquitous presence in our everyday life. Together with a social media revolution, which it supports and enhances, mobile technology is reordering the way the world operates and communicates today, radically transforming politics, business and social life. Relatively inexpensive, mobile technology transcends the "economic divide," with the majority of the world's population, even in less affluent societies, owning or having access to cell phones, MP3 players or netbooks. According to Global Mobile Statistics 2012, at the end of 2011 there were 4.5 billion mobile subscriptions in the developing world (76 percent of global subscriptions). Mobile penetration in the developing world now is 79 percent, with Africa being the lowest region worldwide at 53 percent (*Global Mobile Statistics 2012*).

Of the various mobile devices, cell phones or mobile phones are the obvious leaders. These electronic gadgets are used to make telephone calls across wide geographic areas; served by many public cells, they permit the user to be mobile. Internet connectivity, in addition to telephony, now allows modern mobile phones to support a wide variety of other more general computing capabilities, and has ensured this technology an even more secure leadership in the years to come.

Yet, in spite of the unique potential and obvious advantages this mobile technology can offer to modern education, a number of schools have developed a negative, if not openly hostile, attitude to students using cell phones on their premises. While educational research and practice have established various benefits that the use of mobile technology can bring into teaching and learning (Daniels, 2006, 2010; Wayner, 2009; Warschauer & Liaw, 2011), a generally negative attitude toward cell phones in formal educational settings prevails (Brooks-Young, 2010).

As mobile technology makes gigantic strides in its development and is clearly here to stay, institutions need to rethink their policies and practices towards cell phones. But another question is whether all the factions of these institutions are ready to embrace such new policies and practices. To explore this issue, the research presented in this article was done as a part of the larger, MEXT-supported Frontier Spirit Project, carried out by the Faculty of Communication of NUCB. Based on a survey conducted in NUCB in 2011, it addresses the attitudes of students and teachers toward mobile phones as educational tools. Specifically, this paper reports on the results of the research on the ways students and faculty use their cell phones, their cognizance of technology, teachers' propensity to innovate with cell phones and respondents' beliefs about the appropriateness of this technology as a teaching or learning tool.

Why Should Schools Go Mobile

The main reason to address the status of mobile technology in the academic context is the growing dominance of cell phones in all aspects of modern life, education included. Proof of this statement is the amazing progress this technology has made in a relatively short span of time: from the first hand-held Motorola mobile phone of 1973, which weighed 2 kg, to the first Internet- and multimedia-enabled smart phones of 2007. Now, the current generation of cell phones, with Wi-Fi and 4G connectivity, is capable of handling over 425,000 diverse applications.

No less amazing is the speed of consumer-based growth of mobile phone technology. While in 1979, the first commercial cellular network of NTT covered only the Tokyo Metropolitan area, a few years later it had expanded sufficiently to cover the entire population of Japan. While in 1979, the US, UK and Japan were the only countries where mobile phone use had marked growth, at the end of 2011, there were 6 billion mobile subscriptions, equivalent to 87 percent of the world population (*Global Mobile Statistics 2012*). Japan still is one of the top countries for mobile Web use: out of 122 million mobile subscribers (95% of population), almost all of them subscribe to mobile Internet (84% of mobile users). Thanks to this, Japanese consumers are reported to be more advanced in mobile behavior, using mobile Internet, applications and email more than consumers in other countries (*Global Mobile Statistics 2012*).

One more statistical consideration, relevant to the objectives of this research, is the popularity of cell-phones among youngsters. Already in 2004, Selian put forward: "Any examination of the youth market and its usage of mobile telephones must pay special homage to the Japanese market, where phones in the youth market are especially well embedded" (Selian, 2004). According to the data from 2009, in Japan, the ownership rate of child cellular phones is 11.3% in schoolchildren in the lower grades, and 32.8% in the upper-grades. The percentage rises with age, reaching 56.6% in the junior high school population and exceeding 90 percent amongst college students (*Wireless Watch Japan, 2009*). Moreover, with Japanese youth, comfort with electronic and digital communications gadgetry is extremely well established, and social-behavioral issues related to mobile telephone usage are concurrently far better articulated and dealt with in Japan, than elsewhere in the world (Selian, 2004).

But all this remarkable technological progress of cell-phone technology and its popularity seems to halt at the classroom doors. By and large, the schools do not welcome cell-phones or ban their use on school premises outright. Japan is no exception in this policy as in January 2009, the Education, Science, and Technology Ministry of Japan urged primary and middle schools to ban student cell phones (Yamashita, Watanabe, & Uemura, 2009). The most recent evidence of this trend is the introduction by the legislation of Rhode Island, U. S., of a statewide policy that bans texting during school hours (Towne, 2012). Likewise, in many schools across the world "teachers use instructional time at the start and end of each period to collect and then return student cell phones, not understanding that this strategy is often a

waste of time” (Brooks-Young, 2010).

On the other hand, a class of Spanish in a Florida high school eagerly awaits each lesson for their teacher’s command to take out their cell phones and start a vocabulary digital scavenger hunt or submit their test answers through a polling Web site. There, notes are copied with a cell phone camera and text messages serve as homework reminders (Armario, 2009).

What are the reasons for such a divergent treatment by teachers of students’ technology of choice? The answer lies in the enormous potential of mobile phones and the various ways they can be used, which are beneficial or, on the contrary, detrimental to learning. Without going into too much detail of this continuing debate, it will suffice to mention just a few arguments for and against cell phones in education.

The proponents of cell phones emphasize: access to learning resources; multi-functionality, which has significantly increased with Wi-Fi and 3G/4G connectivity; students’ cognizance of technology; and its ubiquity in youth culture. Additionally, with the huge popularity of texting, the amount of reading and writing that young people do with their cell phones is unprecedented.

On the other hand, the opponents of the technology will mention some negative outcomes of using phones such as cheating on exams, inappropriate multitasking, disruption of classes and deviations from normative writing in text messages. There are even weightier cases of cell phone misuse, such as harassment, bullying, ‘sexting,’ and immoral use of built-in cameras in public restrooms, swimming pools and school locker-room facilities. For all these reasons, some schools are fighting, but ultimately losing, an unnecessary battle with cell phones. In contrast, other schools try to incorporate the students’ technology of choice into their teaching practices.

The NUCB Study and Results

With such contradictory attitudes towards cell phones in education, it was interesting to explore the status of this mobile technology as a learning and teaching tool in one of the leading and technologically advanced universities of Japan, the Nagoya University of Commerce and Business (NUCB). Historically, NUCB has been at the forefront of technical innovations in education. Since 1985 the university has been supplying all of its students with notebook computers, distributing about 1000 computers annually. Also, NUCB was one of the first universities in Japan to introduce wireless Internet connectivity on all its campuses in 2000 and a virtual learning and course management system, *Blackboard*, in 2002.

For a university of such exemplary keenness on technology, the research on the attitudes towards cell phones among its constituency has an obvious pragmatic significance, as it can guide relevant institutional policies and practices. There are two trends to be taken into consideration. On the one hand, Stockwell (2008) predicted that mobile learning would become a prominent trend in the near future, because of the prevalence of mobile devices among learners using such technologies. On the other hand, with mobile phones, this trend might be compromised by the controversial stance of teachers towards embracing such technology. It is apparent that the effective and successful use of technology in education is closely related to teachers’ attitudes towards mobile technology and their degree of willingness to experiment and innovate with it (Luan et al., 2005).

To gauge the position of key players on the potential arena of learning with cell phones at NUCB, a survey was conducted among 40 faculty and 64 3rd-year students (Faculty of Communication). The purpose of the study was to address two research questions as follows:

1. What access, experience and attitudes do students have with regards to mobile phones as communication and learning tools?
2. What access, experience, propensity to innovate and attitudes do teachers have towards mobile

phones as communication, teaching and learning tools?

To answer these questions, two short, similar questionnaires (11 questions for students and 12 questions for teachers) were administered with a 100% (N=64) and 95% (N=38) return rate correspondingly.

First, the survey addressed the issue of access to mobile phones and asked student respondents if they had a cell phone and what kind of phone it was (a typical cell phone or a smart phone). As was expected, 100% (N=64) of students possessed a cell phone and half of them (N=32) had a smart phone (3 students had two cell phones). Teachers were asked if they had a cell phone and, if not, what was the reason for that. It turned out that 3 out of 38 teacher respondents, who returned the questionnaire, answered that they did not have a cell phone because there was no need for one (N=2) and s/he was “happy without it.” Two teachers, who did not return the questionnaire, also excused themselves by explaining that they had no phone. Thus, the significant majority of the population surveyed had access to mobile technology and, thus, qualified to pass judgment on it.

The major factors connected with the teachers’ and students’ ability or propensity to innovate with technology are technology cognizance, and the ability and intention to explore technology, according to Nambisan, Agarwal, and Tanniru (1999). We included in the survey a question about personal experience with a cell phone, which is believed to be closely related to technology cognizance; therefore, the next question was about the length of time the respondents had had cell phones in their possession. The distribution of answers by percentage is shown in Table 1.

Table 1. Length of Time of Mobile Phone Usage

	More than 10 years	5-10 years	3-5 years	1-3 years
Teachers	51%	39%	6.6%	3.4%
Students	17%	48.4 %	26%	8.4%

The predominance amongst teachers in the category “More than 10 years” is quite natural, since the respondents in the “Students” group averaged 20-21 years old. However, it is worth noting that 11 students reported having their cell phones since they were 10 years old and 31 students since the age of 15. This finding supports a well-established fact that the consumer base of mobile phones comprises very young users.

Another issue is whether the length of use corresponds with technology cognizance, which relates to user knowledge of technology capabilities, its features and potential use (Chou, 2005). To gauge this factor we addressed various functions of cell phones and frequency of their use by the respondents. Table 2 shows the numerical and percentage distribution of answers for both groups of respondents, teachers (T) and students (S).

Table 2. Frequency of Using Cell Phone Functions

Function	Frequency				
	Always T/S	Often T/S	Sometimes T/S	Almost never T/S	Never T/S
Making calls	N = 11 / 17 % = 29 / 27	N = 14 / 30 % = 37 / 47	N = 10 / 12 % = 26 / 18.4	N = 0 / 4 % = 0 / 6	N = 3 / 1 % = 8 / 1.6
Receiving calls	N = 11 / 21 % = 29 / 33	N = 14 / 26 % = 37 / 41	N = 10 / 15 % = 26 / 23	N = 3 / 2 % = 8 / 3	N = 0 / 0 % = 0 / 0
Sending text messages	N = 10 / 28 % = 26 / 44	N = 5 / 27 % = 13 / 42	N = 6 / 6 % = 16 / 9	N = 9 / 3 % = 24 / 5	N = 8 / 0 % = 21 / 0
Receiving text messages	N = 10 / 31 % = 26 / 48	N = 6 / 23 % = 16 / 36	N = 7 / 7 % = 18 / 11	N = 7 / 3 % = 18 / 5	N = 8 / 0 % = 22 / 0
Taking photos	N = 3 / 9 % = 8 / 14	N = 6 / 17 % = 16 / 27	N = 9 / 29 % = 24 / 45	N = 10 / 7 % = 26 / 11	N = 10 / 2 % = 26 / 3
Listening to sound files	N = 1 / 7 % = 3 / 11	N = 1 / 13 % = 3 / 20	N = 4 / 21 % = 10 / 33	N = 6 / 12 % = 16 / 19	N = 26 / 11 % = 68 / 17
Accessing radio/TV	N = 0 / 1 % = 0 / 1.6	N = 1 / 5 % = 3 / 8	N = 5 / 11 % = 13 / 17	N = 11 / 24 % = 29 / 38	N = 21 / 23 % = 55 / 36
Accessing the Internet	N = 4 / 36 % = 10 / 56	N = 2 / 15 % = 6 / 23.4	N = 7 / 10 % = 18 / 16	N = 5 / 2 % = 13 / 3	N = 20 / 1 % = 53 / 1.6
Playing games	N = 0 / 8 % = 0 / 13	N = 0 / 20 % = 0 / 31	N = 1 / 20 % = 3 / 31	N = 5 / 6 % = 13 / 9	N = 32 / 10 % = 84 / 16

It is evident from these results that the basic, telephoning, function – making and receiving calls – was almost always or often used by approximately all participants, although among teachers, 8% never, or almost never, made or received telephone calls. With text messaging, however, the picture is entirely different: while the majority of students always or often sent and received text messages, 45% of teachers never, or almost never, sent them and 40% never received text messages. In contrast, only 5% of the students answered negatively to both questions. This finding is consistent with the known fact that the younger generation is a generation of typists, not talkers, the latter attributed to the older generations (Baron, 2008). Also, it is possible to infer that only one third of teachers, regularly texting themselves, would be comfortable adopting this method of communication in their teaching practice.

The most unpopular function of all with both groups was accessing radio or TV programs with cell phones. It turned out that only 16% of teachers and only 25% of students sometimes did so.

The last two functions surveyed – Internet access and gaming – showed very marked, though diametrically opposed, preferences in both groups. Only 34% of teachers accessed the Internet with their phones, and 66% did not, while almost 96% of students did so on a regular basis. And, not surprisingly, teachers did not play games on their cell phones while 75% of students did so at least sometimes.

Taking photos does not seem to be among the most popular of cell phone functions. Still, the percentage of teachers who had never used this function was much higher, compared to students (23% vs. 3%). Anecdotally, classroom behavior observation registers a sharp increase, recently, in students' practice of taking snapshots of lecture slide shows, whiteboard notes or other classroom displays; so, if the survey were conducted again, it would most likely show a much higher index of use of the cell phone photo function by students.

The next surveyed function was that of listening to sound files on mobile phones. It did not appear to be a popular activity with teachers: 84% of them never or almost never did so. Neither was it particularly

popular with students – more than a third of them (36%) reported never or almost never listening to sound files on their phones. One of the reasons may be the popularity of iPods in Japan. Also, it is likely that the limited memory of cell phones puts space at a premium, with preferences given to photo space over recording space.

This part of the study shows that teachers have much less appreciation of cell phone functions such as Internet access, message communication, listening to sound files and gaming. While the latter activity is only recently gaining some recognition as an educational tool, the other three have already been proved valuable for teaching and learning. In the area of CALL, in particular, research and practice show that they are quite often successfully used in the learning of foreign languages.

It is obvious that above-stipulated research question about the correlation between cognizance of technology and length of its use can be answered negatively. In the Teachers group, at least, no such relationship was observed: while most teachers have considerable experience – in terms of length of time – of using a cell phone, they do not display an equally considerable versatility in making the most of its potential. In the Students group, however, the issue of technology cognizance was explored in a more straightforward way: the Students variant of the survey asked respondents directly if they were aware of all possible uses of the cell phone. The answers to the statement, “You know everything your cell phone can do (all its possible uses),” were distributed in the following manner: “Strongly agree” –6% (N=4); “Agree” –48.4% (N=31); “Not sure” –41% (N=26); “Disagree” –3% (N=2) and “Strongly disagree” –1.6% (N=1). The majority of student population displayed a significant degree of mobile technology cognizance, though many doubted if they knew everything there was to know about their cell phone’s potential.

Following Nichols’ (2008) argument that the success of technology-facilitated learning depends on teacher acceptance of it, in our survey we decided to replicate the approach to measuring acceptance suggested by Tai and Ting (2011) in their study of pre-service teachers’ attitudes towards MALL. Thus, we made an inquiry into such fundamental variables of acceptance as perceived ease of use, perceived usefulness and propensity to innovate with a cell phone.

Perceived ease of use is important for understanding acceptance of technology, as it refers to the degree to which a person believes using a particular technology will be effortless (Davis, 1989). This was directly measured by the responses to the statement, “You find a cell phone easy to use.” The answers are shown in Table 3.

Table 3. Perceived Ease of Use

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Teachers	N=5 (13%)	N=16 (42%)	N=12 (32%)	N=5 (13%)	N=0 (0%)
Students	N=17 (27%)	N=40 (62.4%)	N=6 (9%)	N=1 (1.6%)	N=0 (0%)

In both groups, the number of persons who found the technology difficult to use was small; however, it was remarkable that one third of teachers were not sure about their answer to this question. This finding correlates well with the low index on technology cognizance, as shown by the number of cell phone functions regularly used by teachers. Overall, the Students group indicator of perceived ease of use was much higher than that of the Teachers group: 89.4% of students vs. 55% of teachers agreed or strongly agreed with the stated ease of technology use.

Another determinant of user acceptance was the perceived usefulness of technology, which is defined as the degree to which a person believes using a particular technology will enhance her or his performance (Davis, 1989; Teo et al., 2008). We measured this determinant by soliciting answers to the following questions: a) “A cell phone helps you to communicate with people;” b) “A cell phone helps you access relevant

information,” and c) “A cell phone increases your effectiveness” (Teachers Questionnaire) or “A cell phone helps you in your study” (Students Questionnaire).

The first two questions focus on concrete functions that indirectly relate to usefulness, as communication and access to information may not be perceived as necessarily related to a person’s effectiveness. But in the field of education, these two activities are essential, and the ability to perform them with the help of a cell phone serves as a powerful argument in its favor. Let’s look at the distribution of answers to these two questions (Table 4 and Table 5).

Table 4. Perceived Usefulness for Communication

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Teachers	N=10 (26%)	N=26 (68%)	N=1 (3%)	N=0 (0%)	N=1 (3%)
Students	N=24 (37.5%)	N=37 (57.5%)	N=3 (5%)	N=0 (0%)	N=0 (0%)

Table 5. Perceived Usefulness for Access to Information

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Teachers	N=4 (10%)	N=14 (37%)	N=15 (40%)	N=4 (10%)	N=1 (3%)
Students	N=21 (33%)	N=38 (59%)	N=5 (8%)	N=0 (0%)	N=0 (0%)

With little exception, both teachers and students agree to the usefulness of cell phones for communication. As for the potential of the device for accessing information, the data required a more thorough analysis. First, access to information via a cell phone was seriously undervalued by teachers; only half of them judged that this function could be usefully performed with the phones. On the contrary, the vast majority of student respondents (92%) appreciated this function of their phones and used it extensively, as is shown in Table 2. Second, there was a certain discrepancy between teachers’ responses to the question, whether they access the Internet with their phones (Table 2), and whether they agreed with the usefulness of using their phones for such a function (Table 5). The first question was answered positively only by 34% (N=13), but a bigger percentage of the respondents (N=18, 47%) agreed that cell phones can be useful for accessing information on the Internet. A plausible explanation of this divergence might be that teachers realized that such function was available with cell phones, but in practice, they rarely used it.

The third question, directly related to the measurement of the perceived usefulness of technology, had two variants. Teachers were asked if they agreed with the statement, “A cell phone increases your effectiveness” and students were asked if the cell phones helped them in their study. Table 6 shows the opinion of both groups on this issue.

Table 6. Perceived Usefulness for Effectiveness (Teachers) and Study (Students)

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Teachers	N=2 (5%)	N=14 (37%)	N=20 (53%)	N=2 (5%)	N=0 (0%)
Students	N=5 (8%)	N=27 (42%)	N=23 (36%)	N=7 (11%)	N=2 (3%)

It is evident, once again, that students are ahead of teachers in reaping the advantages of mobile technology for their purposes, study in particular. While more than a third of them were not sure whether the phones assisted them in study, half of them were positive that cell phones could be instrumental. We expected this index to be higher, judging from the overall acceptance of technology by students, but the ob-

tained shortfall corresponded well with the data on cognizance of technology quoted above. A similar 54% of students were not sure that they knew all the functions of the cell phone, thus, probably, the same group (53%) hesitated about the utility of technology for their everyday activities. There might also be another valid explanation: students were just not familiar with the ways cell phones could be implemented in learning, which again brings us to teachers' acceptance of this technology. This factor is, indeed, not high, as is shown by the table above; more than half of teachers were not sure if mobile technology increased their effectiveness.

The following part of the survey specifically addressed the status of mobile technology in education through the exploration of attitudes toward this issue on the side of the key players: teachers and students. With a slight variation, the same question about the need to use cell phones for teaching and learning purposes was asked in both questionnaires (Table 7).

Table 7. Perceived Necessity to Use Cell Phones for Teaching/Learning Purposes

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Teachers	N=0 (0%)	N=1 (3%)	N=15 (39%)	N=12 (32%)	N=10 (26%)
Students	N=21 (33%)	N=38 (59%)	N=5 (8%)	N=0 (0%)	N=0 (0%)

For the most crucial postulation for the whole study, the key players are clearly on diametrically opposite sides; the overwhelming majority of students (92%) are for the use of cell phones in teaching and learning and the overwhelming majority of teachers are either hesitant or openly against. No other question of the survey produced such a tremendous disparity of opinion between the two groups and, as such, it was quite predictive of the continuing resistance of academics to the presence of cell phones in the classroom. The plausible reason for the negative attitudes of teachers towards this technology may lie in the fact that they more often encountered the misuse of cell phones at schools than the effective implementation of this technology in teaching practice.

Indeed, the next findings can be supportive of such an explanation. The question whether teachers had "ever used / seen / read about / heard about or thought about any teaching/learning activities with cell phones" was answered negatively by the majority of respondents (N=24, 63%). When students were asked if they had "ever heard about any teachers and students using cell phones for studying," 60% of them answered "yes".

The teachers' propensity to innovate with cell phones was further probed by two supportive questions. The first was a suppositional rephrasing of the previous question: "If you ever see, read or hear about some interesting and effective teaching/learning activities with cell phone, will you try to use them in your course?"

Only 10 teachers (26%) answered "yes," while 18 (48%) answered "No," and 10 abstained. Teachers were also asked to speculate on the possibility of using cell phones for teaching and learning purposes. The answers were distributed in the following manner (Table 8).

Table 8. Perceived Possibility of Implementing Cell Phones for Teaching/Learning

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Teachers	N=0 (0%)	N=8 (21%)	N=18 (47%)	N=6 (16%)	N=6 (16%)

Table 8 clearly demonstrates that the use of mobile technology for teaching is still an innovative practice for the vast majority of teachers. Most of them had not heard about such practice and did not consider

it a possibility. Also, their reluctance or inability to innovate and experiment with cell phones may testify to a relatively early stage of mobile technology penetration into academic settings, the stage when negative experiences are predominant and keep teachers apprehensive of any presence of cell phones at school.

The latter supposition seems like a feasible explanation, as both groups of respondents still commonly perceive mobile technology as an “outlaw” in the academic context. Perhaps, both teachers and students derived a very narrow, regulatory meaning of the concluding assertion of the survey, “Students should not use cell-phone in the classroom,” as it was on this particular issue that they were in surprisingly unanimous agreement (Table 9).

Table 9. Perceived Inappropriateness of Cell Phones in the Classroom

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Teachers	N=13 (34%)	N=15 (40%)	N=7 (18%)	N=2 (5%)	N=1 (3%)
Students	N=9 (14%)	N=30 (47%)	N=18 (28%)	N=4 (6%)	N=3 (5%)

While it was an expected finding that 74% of teachers would be against cell phones in their classrooms, the significant (61%) student approval of prohibition on cell phones was quite unforeseen, especially in the context of the overall support and acceptance of mobile technology by younger respondents. Certain stereotypes of thinking die hard, and schools have definitely worked hard to install a ban on cell phones for students to readily accept it. Another stereotype is the knowledge that students commonly use cell phones in class for other than study purposes. Also, the response may reflect a shared value for teachers and students of the importance of classroom time for study. The significant distinction though is that students can imagine the possibilities for integration of the technology with studying while many teachers cannot.

Conclusion

Cell phones as the most affordable and ubiquitous mobile technology at the disposal of education can offer numerous opportunities for teaching and learning. Another issue is the willingness of education constituencies to explore and utilize these opportunities. This investigation tested the attitudes of teachers and students at one of the leading universities in Japan, NUCB, toward using mobile phones as learning and teaching tools. Based on the results, we can conclude that in spite of the longer experience of using the technology, the greater part of teachers are less cognizant than students about different functions of cell phones and do not use them as extensively and frequently as students do. Moreover, they are less familiar with various applications of cell phones in education and are reluctant to either consider or explore them. As the result, the bulk of teachers support the outdated prohibition on mobile phones in formal educational settings. Students, being consistently exposed to the policy of bans on cell phones, familiar with their inappropriate use in class and lacking any alternative experience, also readily side with teachers on this issue, even though they are more knowledgeable about the potential of mobile phones and exploit their functions more readily.

This somewhat discouraging conclusion for mobile technology advocates can be mitigated, to some degree, by the limitations of this study. First, to maintain a more or less representative participant pool, no discrimination between the respondents owing smart phones and those possessing mobile phones, with or without Internet connectivity, was made. This obviously could have affected the cognizance of the technology and awareness of various ways the technology can be employed for teaching. One potential problem

for assessing the cognizance throughout this research is the ability of non-Japanese teachers to access the instructions for all functions in their native languages. Furthermore, a slight weakness of this research was the lack of balanced questions in both instruments, with the Teachers' Questionnaire not directly addressing the question of their familiarity with all the potential of their phones.

Also, the wording of some questions was too general. If such issues as, for instance, the application of Internet connectivity in the classroom or message exchange for educational purposes, were probed in more detail, the index of teachers' propensity to innovate might be higher.

Nevertheless, the situation with regards to cell phone use at NUCB accords well with the predominant stance on the issue elsewhere. While some of the teachers increasingly realize that multifunctionality of cell phones allows use as powerful educational tools, the majority are still apprehensive of this technology as the same multifunctionality lies at the basis of various misuses and abuses of technology in formal educational settings. The latter obviously outweighs the advantages of cell phones in the perception of both teachers and students, especially since the accounts of the effective utilization of mobile phones in teaching practice are currently not widely known and popularized.

As mobile technology progresses, smart phones are getting more affordable. Consequently, with more people exploring and enjoying the full range of functions smart phones can offer, the innovative and effective applications of the latter in teaching and learning will increase, improving the attitudes toward cell phones and their status in education.

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Appendices

Appendix 1. Teacher Questionnaire

1. Do you have a keitai (mobile, cell phone)? Please CIRCLE the appropriate answer.

YES NO

If NO, why not _____

2. How long have you had it?

> (more than) 10 years > 5 years > 3 years > 1 year

3. What functions of the keitai do you use and how often? Please, check ✓.

Function/Frequency	Always	Often	Sometimes	Almost never	Never
Making calls					
Receiving calls					
Sending text messages					
Receiving text messages					
Taking photos					
Listening to sound files					
Accessing radio/TV					
Accessing the Internet					
Playing games					

4. Keitai helps you to communicate with people.

Strongly agree Agree Not sure Disagree Strongly disagree

5. Keitai helps you access relevant information.
Strongly agree Agree Not sure Disagree Strongly disagree
6. Keitai increases your effectiveness.
Strongly agree Agree Not sure Disagree Strongly disagree
7. You find keitai easy to use.
Strongly agree Agree Not sure Disagree Strongly disagree
8. It is possible to use keitai for teaching/learning purposes.
Strongly agree Agree Not sure Disagree Strongly disagree
9. It is necessary to use keitai for teaching/learning purposes.
Strongly agree Agree Not sure Disagree Strongly disagree
10. Students should not use keitai in the classroom.
Strongly agree Agree Not sure Disagree Strongly disagree
11. Have you ever *used / seen / read about / heard about or thought about* (please circle the appropriate) any teaching/learning activities with keitai?
YES NO
If YES, could you list or describe these activities below↓?)
12. If you ever see, read or hear about some interesting and effective teaching/learning activities with keitai, would you like to use them in your course?
YES NO
- ↓ Please list here any ideas/suggestions/experience of using keitai for teaching.

Appendix 2. Student Questionnaire

1. Do you have a keitai (mobile, cell phone)? Please CIRCLE the appropriate answer.
YES NO
- If YES, what kind? Smart Phone/iPhone Usual Keitai
- If NO, why not _____
2. How long have you had it?
> (more than) 10 years > 5 years > 3 years > 1 year

3. What functions of the keitai do you use and how often? Please, check ✓.

Function/Frequency	Always	Often	Sometimes	Almost never	Never
Making calls					
Receiving calls					
Sending text messages					
Receiving text messages					
Taking photos					
Listening to sound files					
Accessing radio/TV					
Accessing the Internet					
Playing games					

4. Keitai helps you to communicate with people.

Strongly agree Agree Not sure Disagree Strongly disagree

5. Keitai helps you get necessary information.

Strongly agree Agree Not sure Disagree Strongly disagree

6. Keitai helps you in your study.

Strongly agree Agree Not sure Disagree Strongly disagree

7. You find keitai easy to use.

Strongly agree Agree Not sure Disagree Strongly disagree

8. You know everything keitai can do (all possible uses).

Strongly agree Agree Not sure Disagree Strongly disagree

9. We need to use keitai for teaching and learning.

Strongly agree Agree Not sure Disagree Strongly disagree

10. Students should NOT use keitai in the classroom.

Strongly agree Agree Not sure Disagree Strongly disagree

11. Have you ever heard about any teachers and students using keitai for studying?

YES

NO

