

## STUDENTS' PERCEPTION TOWARD PERSONAL INFORMATION AND PRIVACY DISCLOSURE IN E-LEARNING

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### ABSTRACT

This research investigates East Asian students' perceptions towards e-learning privacy. The survey was first carried out in Japan (N1= 255) and China (N2=307) in 2009. In 2012 the same survey was conducted again in these two countries but with different participants (N3=175, N4=63). To survey in different countries is to verify whether e-learning privacy perceptions have cultural factors. To conduct the same survey with a three-year interval is to verify whether e-learning privacy perceptions change over time. Actual registered private information on two e-learning systems is analyzed, too in order to confirm the findings in the survey. The findings are: while students are indeed concerned about their private information being online, they support their teachers collecting and using their private information for learning purposes. East Asian students consider personal photo, mobile phone number, and physical address to be very private and are reluctant to register these items even in e-learning systems

**Keywords:** e-learning, privacy perceptions, art and language education, e-learning system design

### INTRODUCTION

Personal information/privacy protection is an ongoing concern in our information society. The majority of countries in the world have drafted laws to protect its peoples' personal information/privacy from intrusion (OECD Report, 2006). In e-learning, learner concerns over the security of their personal information/privacy heavily influence a learner's willingness to disclose information themselves in online activities. The more learners are concerned about the security of their online personal information, the less they will disclose about themselves (Dinev, Hart & Mullen, 2008). Teachers cannot force or pressure students to provide personal information even for learning purposes. However, when an e-learning teacher better knows the personal information/privacy concerns of their students, they will be better able to decide what information to collect and how it should be used. Teachers can feel more secure collecting information that students are willing to divulge than information learners are hesitant to disseminate. Not only should teachers be familiar with personal information protection laws, they should also ask what concerns their learners have about e-learning privacy and personal data disclosure.

Our questions are:

1. How much are East Asian, mainly Chinese and Japanese students concerned about their e-learning privacy and what types of e-learning private information are they concerned about most?
2. What are students' perceptions toward online private information collection and monitoring by their teachers for learning purposes?
3. Do students in different countries have different perceptions on their online private information and are these perceptions changing over time?

### *The relationship of personal information/data and privacy*

While there is no universally agreed upon definition of "privacy" (Lanier, 2008); one definition is that privacy is the "desire of people to choose freely under what circumstances, and to what extent, they will expose themselves, their attitude, and their behavior to others" (Westin, 1967). Another definition holds that "privacy is the right to be let alone" (Warren & Brandeis, 1890).

In Japan, "personal information" is defined as "information about a living individual which can identify the specific individual by name, or other description contained in such information, including such information as will allow easy reference to other information and will thereby enable the identification of the specific individual" (Cabinet Office, Government of Japan, 2005) Therefore, privacy could also be understood as the right to exercise control over disclosure of personal information that could expose a person's identity. In this

paper, the authors mainly consider privacy issues in relation to issues of disclosure and use of personal information.

**Personal information and privacy protection in e-learning**

It is usually unavoidable that an e-learning teacher collects a considerable deal of personal information about a student, either manually or through a program/system, for the purposes of better class management or better tutoring. Such information may include student name, e-mail address, mobile phone number, birthday, birthplace, age, or facial photo. The learning system itself may automatically record the learners' learning preferences, learning history, and learning outcomes through cookies or any other preset programs. Also, uploaded homework, collaborative online projects, and grades of online assignments can be considered private information. In a digital era, personal information stored electronically can leak and be spread much more easily than in the past when such information was stored on paper (Shimakawa, 2005). Student personal information needs to be protected, not only in PC e-learning systems or programs, but in any form of learning using Information Communication Technology (ICT) such as mobile learning (mLearning). E-learning teachers need to address how to use learners' personal information without inadvertently intruding upon students' privacy.

**E-learning privacy and technical security**

“Security” in e-learning usually refers to the security technology used in an e-learning program with respect to hardware and software (Weippl, 2005). An e-learning system which is technically highly secured can minimize learner concern over unauthorized access to students’ personal information, theft of accounts and passwords, or virus attacks (Lim & Jin, 2006). As issues of security technology are solved mainly by system designers, network specialist, or e-learning organizing institutions, rather than by teachers, these issues will not be addressed in this paper.

**METHOD**

**Participants**

For the purpose of verifying if students’ perceptions of e-learning privacy vary over time and country regions, surveys were carried out in two East Asian countries: Japan and China - during April 2009, and July 2012. Totally 800 students took part in the surveys. All participants were familiar with studying in one or more e-learning environments. There is no big gap in participants’ ages.

Table 1. Participants of e-learning privacy survey

Survey year	Country	Number of participants			Average age (SD)	Surveyed universities
		Male	Female	Total		
2009	Japan	151	104	255	19.1 (SD=2.7)	Hiroshima Shudo University, Yamaguchi University
2009	China	83	224	307	21.3 (SD=3.3)	Yangzhou University, Shandong University of Chinese Traditional Medicine, The Open University of Nantong City, Ningbo University of Technology, Jiangnan University
2012	Japan	120	55	175	20.2 (SD=0.8)	Shimane University
2012	China	43	20	63	20.7 (SD=2.12)	Anhui Jianzhu University

Aside from the above questionnaire, the investigation on user registration information from Moodle – a popular open-source LMS and another e-learning program called InterCussion was conducted in 2013 by one of the authors in Japan. Profiles of 152 users on Moodle and 109 registers on InterCussion were examined.

**Data collection**

The survey conducted in 2009 were in paper-and-pencil format. The printed questionnaire was distributed in class by the teachers and collected in class when it was answered. Completed questionnaire sheets collected from 5 different universities in China were posted to Japan for manual transcribing. The survey in 2012 was carried out online. Students were asked to access the survey URL and finish the questionnaire online. On Japan side, students filled in the questionnaire in PC classrooms with their teacher in class. On China side, the survey URL

was sent to 78 students by email. And 63 students responded within a one week duration. As the survey was answered at ones' own volition for Chinese students, it was designed to refuse repeated submission from the same IP address. When survey data was gathered and analyzed, one author in Japan accessed Moodle and InterCussion as a system administrator role to analyze real registered users' profile information.

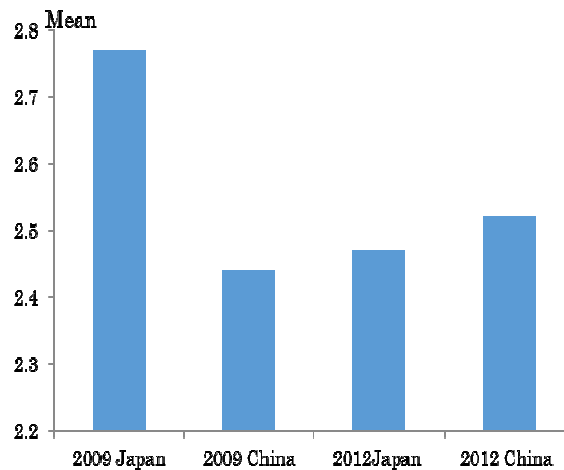
## RESULTS

### Survey Results

The questionnaire consisted of 8 questions and a request to give one free comment (See Appendix or the URL of <https://ix1.inter-scc.jp/ic/e?i=TBp0Ag1K8Hk> ). The first question gathered demographic data such as the participants' gender, age and grade level. Questions 2-8 elicited participants' perceptions and attitudes to e-learning privacy disclosure. These questions (2-8) can be grouped into the following three categories:

1. Questions investigating participants' self-assessment of their knowledge of privacy protection laws (Question: 2 )
2. Questions investigating participant attitudes toward the current use of their private information by their teachers (Questions: 3, 6, & 7).
3. Questions investigating the degree of participants' concerns over specific items of private information (Questions: 4, 5, 8 ).

Most of countries in the world have promulgated laws to protect people's privacy (OCED,2006). However, in different countries, people's understanding and recognition of the laws may be different. Question 2 asks students in Japan and China to self-rank their knowledge toward privacy protection laws. See Fig.1 below.

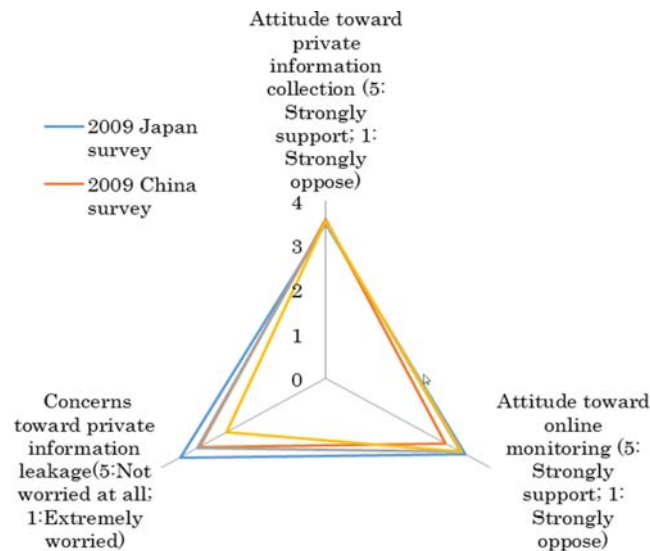


**Figure.1** Students' self-assessment on privacy protection law knowledge (5: Very familiar; 1: Don't know at all)

The data shows that students in both countries are aware of the existence of privacy protection laws, but are not very confident with their knowledge on the laws.

In 2009, Japanese students self-ranked higher than Chinese students, and in 2012, the result reversed. However, both differences are not statistically significant according to *t*-test ( $t(560)=1.423, p<.05, t(368)=0.190, p<.05$ ).

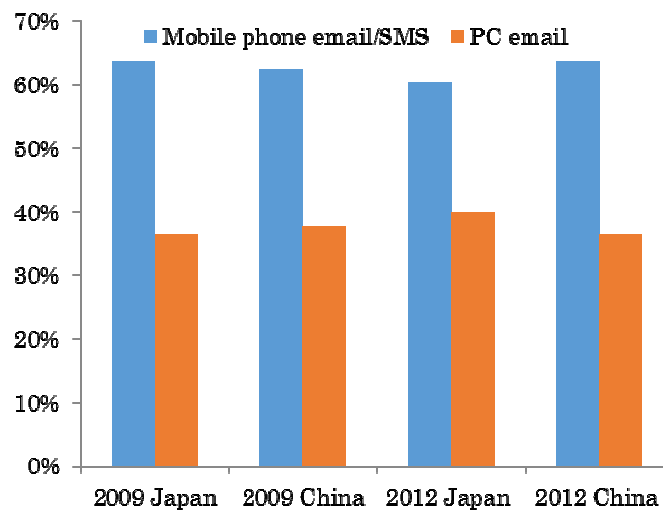
Students' attitude toward teachers' collection of their online registration information as well as learning information are the very factors that this study tries to delineate. If students are too much fearful of their online private information being stolen, leaked or sold to a third party they will not be willing to join any e-learning program or actively involve in any online-learning activities. Therefore, it is not overstating to say that online privacy issues are one of the keys for a successful e-learning project (Jerman-Blaz'ic & Klobuc'ar, 2005). The data in terms of students' attitude towards email address collection, online-learning monitoring, as well as their concerns of private data leakage are shown as follows.



**Figure. 2.** Students’ perception of their e-learning privacy

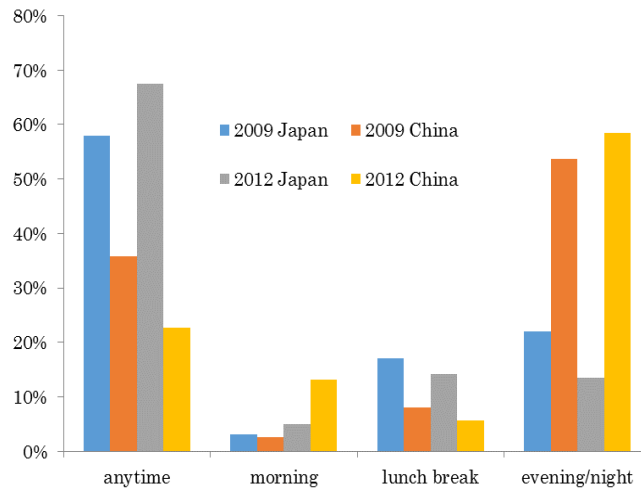
The graph clearly shows that in general students in both countries support their teachers’ collection of their email addresses, and understand and trust their teachers’ monitoring their learning history and learning preferences on e-learning systems. However, degrees of support and understanding are different. Japanese students are more supportive of letting their teachers use their private data while Chinese students are more cautious. (Online monitoring:  $t(560)=5.54, p<.05$ ; Concerns of private data leakage:  $t(560)=5.88, p<.05$ ). Statistically, there is no difference between the attitude of Chinese students and Japanese students toward email address collection by their teachers. Difference between data in 2009 and 2012 is not significant, either.

Question 4 asked about what communication tool, PC email or mobile phone email/Short Message Service (SMS), that students preferred to use for contacting and being conducted in terms of e-learning matters. The result shows in the following graph.



**Figure 3.** Students’ preferred email tool for e-learning communication

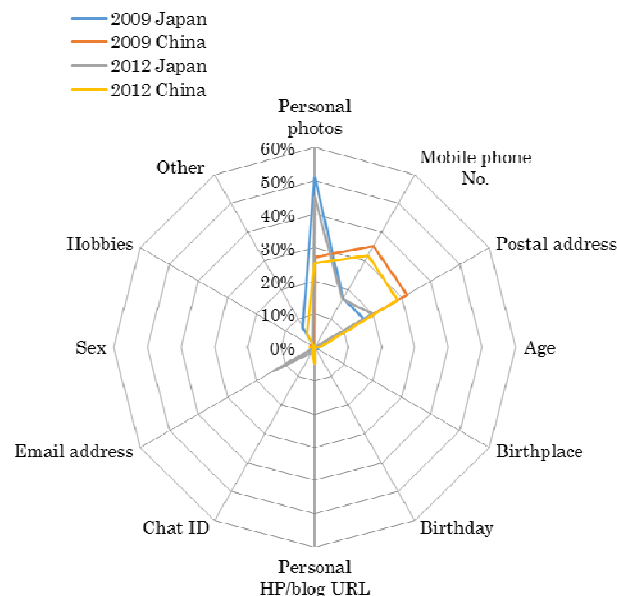
The data implies that majority students both in Japan and China preferred to use mobile phone for message communication in e-learning. And these preferences did not change with passing time.



**Figure 4.** Student preferred time to be contacted

Question 5 investigated students’ preferred time for being contacted via mobile phone. The data shows more than half of Japanese students (58% in 2009 and 67% in 2012) think they can be contacted at any time. Chinese students (54% in 2009 and 58% in 2012) preferred evenings or night for e-learning contact. A very small percentage of Chinese students regard lunch time as a good time for contact. See Fig. 4.

The purpose of Question 8 is to find out when students register with an e-learning system what type of private information they are most reluctant to share. The results show that regardless of regions, 2012 or 2009, the private information that students are most reluctant to disclose is personal photos, mobile phone numbers, and physical address. The data further indicates that Japanese students (51% in 2009 and 45% in 2012) regard personal photo as the top sensitive information and they do not want to upload to e-learning systems. While Chinese students (35% in 2009 and 32% in 2012) think their mobile phone number is the private information that they are most cautious to disclose. The other sensitive private information and less sensitive private information are also shown in Figure 5. There is no statistical significance between the student participants in the same country in 2009 and in 2012, which means no change over time can be seen in students’ perception towards what is sensitive private information.



**Figure 5.** What type of private information are students most cautious about?

For most of survey items participants are encouraged to write down reasons for their answer. And the final item of the survey is to ask participants’ general comments on e-learning privacy. These comments directly from learners provide the first hand source to expound the survey outcomes. The Discussion part will look closely into students’ written feedback.

### Registration Results in e-learning Systems

Three of the surveys were administered in classrooms with teachers in class. Students answered the questionnaires, either by paper- and- pencil or online, then turned them in to the teachers. The existence of teachers could give students a certain kind of pressure so that students may “positively” rank their attitude regarding survey items in which teachers seemed to be involved (Yoshimura, 2001). Thus, in order to confirm the results obtained in the subjective surveys, the objective registration data in e-learning systems is gathered. We first investigated students’ registration information on an email magazine project performed in 2012 which aimed at improving students’ English reading ability. Among the 109 students who registered at their own volition, 72 (66%) registered with their mobile phone email addresses, and only 32 (34%) registered with their PC email address. This result conformed with what was discovered in previous surveys: mobile phone email address is preferred for e-learning contact.

Moodle’s “edit profile” module provides many fields for users to share their private information. See Figure 7 and Figure 8. One author investigated profiles of 152 registers as a Moodle administrator. He discovered that all of the students registered their real names, cities, countries. Regarding email addresses, as they were told that Moodle is mainly a PC-oriented LMS, all of them registered with PC email addresses. Nobody uploaded their personal photos or registered any other private information.



Figure 6. Moodle user profile page (a)

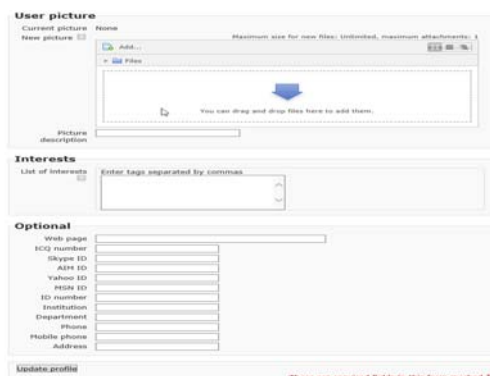


Figure 7. Moodle user profile page (b)

### DISCUSSION AND RECOMMENDATIONS

Personal information/privacy protection is an ongoing concern in our information society. The majority of countries in the world have drafted laws to protect its peoples’ personal information/privacy from intrusion (OECD Report, 2006). In e-learning, learner concerns over the security of their personal information/privacy heavily influence a learner’s willingness to disclose information on themselves in online activities. The more learners are concerned about the security of their online private information, the less they will disclose about themselves (Dinev, Hart & Mullen, 2008). Teachers cannot force or pressure students to provide personal information even for learning purposes. However, when an e-learning teacher better knows the personal information/privacy concerns of their students, they will be better able to decide what information to collect and how it should be used. Teachers can feel more secure collecting information that students are willing to divulge than information learners are hesitant to disseminate. Not only should teachers be familiar with personal

information protection laws, they should also ask what concerns their learners have about e-learning privacy and personal data disclosure.

In Japan the Act on the Protection of Personal Information (Cabinet Office, Government of Japan, 2005) is strictly enforced and widely publicized by mass media. In China there has not been a special private protection law so far, however, privacy protection is formulated within other laws, such as the China Civil Law. In recent years, China has witnessed a breath-taking development in Internet use and now has the most Internet users in the world (CNNIC, 2013). Online privacy has become a daily topic for ordinary Chinese people. Further, in both countries, cyber-crimes are often reported in the news. This makes online privacy concern deeply-rooted among the citizens. However, being aware of the existence of privacy laws does not mean students have read and understand details of the laws or use the laws to protect their cyber interest. This may explain why students in both countries did not rank their knowledge of the law very highly.

Since university students claim to have some degree of knowledge of privacy laws, e-learning teachers too should undoubtedly also read concerning private information/privacy law provisions, and/or attend their institution's training seminars regarding the laws, in order to be equipped with enough legal knowledge to address issues of private data disclosure in e-learning.

Email is still the most commonly used private information for exchanging e-learning content (Levy & Stockwell, 2006). Thus collecting email addresses is very common in an e-learning class. In some e-learning systems, like Moodle, email based registration is a must. The surveys we carried out in Japan and China show that learners in both countries, to a large degree, support email address collection and see it as a necessary, or at least as a "have-to" requirement. For the sake of convenience, the majority of young students prefer to use mobile phone to receive messages from teachers. This is because mobile phone is a carry-on tool and can deal with any urgent task anytime, anywhere. In Japan, almost all mobile phones are internet-connected and every mobile has a unique email address. In China, mobile phone email is not recommended by telecommunication contractors, but SMS is always available at good service. As smart phone has now rapidly become the norm for a progression of university students, Yahoo email, Gmail and Hotmail - which were regarded as PC email accounts - are now also checkable at fingertip.

Nevertheless, one Japanese survey participant commented:

For class announcement or short, text e-learning materials, I would like to receive on mobile phones, but for a big chunk of materials, please send to my PC email address.

This comment reminds teachers of the fact that the mobile phone is an ideal tool for message communication, but not good for heavy e-learning tasks.

Besides positive attitude toward email collection, students in both countries also understand teachers' online monitoring on their learning progress. One Chinese participant commented:

I don't feel comfortable when I realize that my leaning is being watched by teachers. However, without "spying" on us, our teacher would not know how well or how poorly we are doing online. Monitoring or even tracing our learning history is acceptable to me as it is for learning purpose.

Students are cautious about their online private information, but are not worried about their private data being leaked to a third party. Two students' comments may backup this confidence:

I am not worried at all about our private information stored in e-learning systems. First of all, I trust our teachers can safely handle our private information in a secure way. Second, if by any chance, the system is hacked, who want to buy our learning information? Our credit number is not there! (20 year-old first year Chinese boy student)

I think the security of our e-learning system is tight. And I don't think our teachers will neither "sell" nor "tell" our private information to other people. It is not worth anything. (19 year-old first year Japanese girl student)

Interestingly, either in 2009 or 2012, Chinese students were found to be less forgiving than Japanese students in terms of online monitoring and online-learning security. The reason for this might be due to the factor that in China e-learning is mainly used for degree education (Kang & Song,2007) and is not integrated to general high

education as widely as in Japan. And Internet security is not receiving the same attention as in Japan. Five Chinese students commented in 2009 survey that they have experienced email virus or fraud calls to their mobile phones.

Chinese students and Japanese students differ in preferred time being contacted via mobile phone. Most Chinese students take a nap at noon. Therefore the lunch break is not considered to be a good time for any learning task. They feel relaxed and have most free time in the evening or at night. Evenings or night is the best time to contact student's mobile phone. While for Japanese students, most of them do not sleep at noon and they tend to place their mobile phones on manner mode whenever they are busy. This explains why the majority of Japanese students think they can be contacted "anytime".

Neither Japanese nor Chinese university students consider age, personal URLs, birthplace, chat-ID (Instant Messenger ID), and email address to be very sensitive; whereas they are very concerned about uploading their personal photos, telephone numbers and physical addresses. The top sensitive private information for Japanese students is personal photos while Chinese students regard mobile phone numbers as the most sensitive. The reason for this difference remains unclear to the authors and needs to be probed from cultural, social and economic points of view.

Students can control the content of their blogs and home pages. Similarly their chat-ID and e-mails can contain as much, or as little, self-revealing content as the student wishes (for example, you can give yourself any "name" you wish in your e-mail). However, students cannot control the information contained in their facial photos, home addresses or telephone numbers (Boston, 2009). One obvious recommendation therefore is that e-learning teachers in Japan and China avoid collecting or encouraging registration of students' facial photos, telephone numbers, and postal addresses. Regardless of the type of private information being collected from students, e-learning teachers should always make clear the reasons they collect private information from students, and always allow the students to refuse. When using private information, teachers must notify the learners. If personal student information is to be provided to a third party: for example, to another e-learning teacher - this requires consent from the individual student/s. Finally, when learners request modification of their personal information, the request has to be met (Japan Personal Information Act, Chapter 4, Article 18).

## CONCLUSION

Perceptive data from the surveys coupled with objective data from actual in-use e-learning systems is carefully analyzed in this study. The findings show that learners in both China and Japan have positive attitudes toward private/personal data collection by their teachers if for learning purposes, although they did express concerns about some particular privacy items, such as personal photos, postal addresses and phone numbers. Japanese students are the most cautious with uploading of personal photos, while Chinese students are most reluctant to give out their mobile phone numbers. When having options, students in both countries choose to use mobile phones for message communication unless the message contains a large size of attachment. Although learning messages can be sent to Japanese students' mobile phones at any time; for Chinese students, evenings or night is the most ideal time for them to read and respond. Lunch time is fine for Japanese students, but should be avoided for Chinese students, as most Chinese take a nap after lunch.

There is no statistical significance found to imply that students in the same country perceive e-learning privacy differently from what they did three years previously.

By looking into the registration information in two e-learning systems, the above findings obtained from surveys were confirmed. E-learning privacy concerns prevent students from sharing any further information other than required items even with their teachers and cohorts.

The findings via this research indicate that teachers should collect as little personal information as possible. If really necessary, teachers should take into account that students are more concerned with some aspects of their privacy than others, and therefore teachers should do their best to find out which information their learners are apprehensive about providing. For the e-learning system designers, they should take the findings in this paper into account and design a system that is both effective and privacy risk-free.

## RESEARCH LIMITATIONS

The surveys were only conducted in Japan and China. Certainly, Japan and China are important East Asian countries; however another advanced country in e-learning, Korea, is not concluded in this research. This could heavily lower the research reliability as a research from "East Asia". Further, on Japan side, this research only surveyed Japanese learners of English. On China side, this research mainly surveyed students majoring in



English language or art. And analysis on actual e-learning registration was not performed in China as such an investigation needs a system administrator account. The results may display limitations unique to the region and foreign language learners; the same questions posed to learners in Korea and other academic disciplines might yield different responses.

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**Appendix - A Survey on personal data disclosure – learner side**

1. Which year are you currently in?  
 1) first year 2) second year 3) third year 4) fourth year 5) fifth year  
 6) sixth year 7) graduate student  
 Sex 1)male 2)female  
 Age\_\_\_\_\_
  
2. Are you familiar with the Protection of Personal Information Act of Japan/ privacy protection laws in China?  
 5 4 3 2 1  
Very familiar      Don't know at all
  
3. What is your attitude toward teachers asking for private information such as your e-mail address?  
 5 4 3 2 1  
Strongly support      Strongly oppose  
 Reason ( )
  
4. Do you prefer to be contacted through your mobile e-mail address/SMS or your PC e-mail address?  
 1) Mobile phone e-mail 2) PC e-mail 3) either one is fine  
 Reason ( )
  
5. Considering your own privacy, which part of the day do you prefer course-related material to be sent to your mobile phone?  
 1) morning 2) lunch break 3) evening /night 4) any time  
 Other time ( )  
 Reason ( )
  
6. In e-learning, some of your online activities, such as your login time-learning history, and learning preferences will be recorded and monitored. What do you think of this?  
Strongly support. 5 4 3 2 1 Strongly oppose.  
      
 Reason ( )
  
7. Are you worried that the personal data stored in your e-learning program will be stolen or passed on to a third party by your teacher?  
 5 4 3 2 1  
Not worried at all      Extremely worried
  
8. When you register your personal information with an e-learning program, which of the following personal items are you most reluctant to release?  
 1) e-mail address 2) mobile phone number 3) birthplace 4) age 5) address 6) photo 7) personal homepage/ blog site 8) chat ID (Instant Messenger ID) 9) other ( )
  
9. Feel free to write down your comments on the issues regarding e-learning and personal data use and protection.