College Student Online Learning Readiness
of Students in China

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In this research, a group of Chinese university students was surveyed to determine their readiness for online education. A significance in differences between Chinese online learners is useful as one predictor of success in online formal post-secondary courses and may also be used to promote social change among Chinese governmental policy and institutions of higher learning. The McVay online learning readiness survey was used in this research and was first administered to Australian university graduate students, and later to undergraduate students in the United States. Previous research using the McVay Online Readiness survey compared U.S. undergraduate students at a public university in the United States to a select group of Asian students and identified some differences in factor loadings. This study contained 115 students in China Additional data were collected from a university in China to determine whether differences would exist between the previous group of Asian students and whether additional factors would surface. Furthermore, an instructor teaching courses in China provided observations as to the current educational climate and infrastructure in this emerging nation. These comments were interwoven in this study to provide a perspective that might aid in explaining differences in factor loadings. The conclusion is that the model for effective online learning among Chinese students is quite different from that of their western counterparts based upon the factor analysis loadings. While there are common factors involved, additional research is needed to refine the way international students interpret the topics covered by the questions in the questionnaire.

Keywords: online learning, factors, online readiness, China

Introduction

Given the vast differences in the path-dependent nature development of China relative to western nations, this research explores whether there are differences in online learning readiness of the contemporary generation of college students across national boundaries. Specifically, a factor analysis of the McVay Online Learning is used by Readiness Scale (2000, 2001) to determine if the factor loadings are simiar across student populations in

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different geographical areas. This online readiness instrument was administered online in China by an on-ground instructor who explained the rationale and potential use of the survey results to all participants.

The McVay Online Readiness Survey (2000, 2001) first administered Australian university students, and later to students in the United States utilized a factor analysis to identify several factors for assessing the reliability and factorability of the instrument. As recently as 2010, a study that compared U.S. undergraduate students at a public university in the United States to a select group of Asian students identified some differences in factor loadings. Data were collected from a university in China to determine whether differences would exist between previous data collected for a previous Asian students study and whether additional factors might be identified. Significance in differences between Chinese online learners could be useful as one predictor of success in online post-secondary courses and may also be used to promote social change among Chinese governmental policy and institutions of higher learning. Research activity in determining general dimensions of student online readiness (Atkinson & Blankenship, 2010; Atkinson, 2009; Smith, 2005; McVay, 2000) has increased with an attempt to provide educators and administration with useful guidelines. An area that has received far less attention is whether there are differences in student online learning readiness across dissimilar nations.

The online readiness levels of Chinese students may be a crucial role in defining the transportability of online courses across borders. Language differences exist, however, there is some evidence that there are more subtle differences that must be taken into consideration in online course design when dealing with Chinese students. Thus, the focus in this research is whether student's self-reported attitudes toward their abilities to adapt to an online learning environment require adjustments for Chinese classrooms.

Literature Review

Since the development of the earliest distance education courses, instructors have struggled to ascertain learners' needs. The rationale is simple, developing courses that maintain the content area standards while meeting learners' needs when possible. Knowles (1968, 1973, 1975) brought greater emphasis to the need for modified approaches to adult learning and developed the concept of andragogy. His belief in self-directedness would certainly become a foundation for learning years later prior to the introduction of newer technologies like video tapes, other more advanced forms of digital media, and of course, eventually the Internet. With the advent of the web and the relative ease of distance delivery methods, the importance of self-management of one's own learning is heightened. Studies involving students in the U.S. and some European countries began to emerge as interest in Internet-based courses rose, most centered on the methodology of delivery as opposed to the online readiness of the learner. Mercado, Parboteeah, and Zhao (2004) examined the issue from the perspective of the students considering cross-cultural factors based on Hofstede's dimensions. They concluded that the society targeted demanded a modified approach to content presentation. So for feminine societies an artistic and aesthetic design was needed but for highly individualistic countries that operational freedom should be the focus.

Kan and Cheung (2007) examined students in a Hong Kong university comparing the performance of online and face-to-face methods of delivery. The findings were that those in the more traditional setting outperformed their online counterparts at significant levels. Traditional factors were accounted for including age, gender, course load and prior academic performance, however, aspects inherent to Knowles philosophy of self-managed

learning were not taken into consideration. Sherif and Khan (2005) conducted their work in Oman, a middle-eastern country, and a nation that they describe as possessing large numbers of first-generational learners from the perspective of "modernities in curriculum design" (Sherif & Khan, 2005, p. 123). To further complicate their research, no scientific studies were available in Oman to assist with issues of culture. Another key conclusion was that significant gaps existed between students in Oman and the U.S., the U.K. and Australia as demonstrated by the quality of searches initiated.

Lee (2007) more fully understood potential learner differences by comparing students in the U.S. and Taiwan with an attempt to understand consumer tendencies to accept and utilize technology. Male learners displayed higher scores than females in all nine defined constructs. However, Atkinson and Blankenship (2009) found that males viewed online learning to be of lower quality that traditional methods and women tended to be more likely to dedicate the time necessary to complete their online studies than males.

Smith (2003, 2005) administered the McVay Online Readiness Survey (2000, 2001) to Australian university students and utilized a factor analysis to identify two primary factors for assessing the reliability and factorability of the instrument. Prior to this study, the McVay survey used by Smith (2003, 2005) had been used only with Australian students. The two factors identified by Smith (2005) were self-management of learning and comfort with e-learning. Atkinson and Blankenship (2010) replicated the Smith study with U.S. students to see if the same measures or reliability can be achieved with American students. The results of this work led to the proposal that the second factor be renamed to "comfort with non-face-to-face communication" because this better reflects the questions that loaded high on this factor.

China is experiencing rapid economic development and often considered a fast adopter of "communications and information technology" (Liu & Wang, 2009, p. 191). Liu et al. (2009) also consider cultural and individual factors, like mutual trust and learner's motivation. Selim (2005) used Structured Equation Modeling to determine relationships among critical success factors of e-learning. They are: (1) instructor's attitude towards control of the technology; (2) instructor's teaching style; (3) learners' motivation and technical competency; (4) learners' interactive collaboration; (5) e-learning course content and structure; (6) ease of on-campus internet access; (7) electiveness of information technology infrastructure; and (8) organizational support of e-learning activities. In the critical success factors for e-learning as proposed by Chinese scholars (Liu et al., 2009), they place a greater significance on technology and content, followed closely by instructor's attitude and learner's motivation.

According to Yan and Ehrich (2009), China is a nation that "has significant diversity and uneven development socially, economically, and educationally" (Yan & Ehrich, 2009, p. 58). It is not uncommon for training in some areas, especially rural ones, to be valued less than comparable training in urban centers. This paper also points out the continued reliance of older methods like "chalk and talk" (Feng, 2003) which would most likely affect the acceptance of online learning methods, from the perspectives of both the instructor and the student. With more than three million students enrolled at more than 70 online higher education colleges (Chen, Chen, & Wang, 2009), it would seem that online education is generally accepted. Chen et al.'s (2009) study did not consider demographics when analyzing the sample and therefore it isn't known whether adults in smaller urban centers and rural areas are as engaged in this form of learning.

In this study, we will concentrate primarily on the student's self-reported attitudes toward their abilities to adapt to an online learning environment.

Methodology

The McVay Online Readiness Survey was administered to 115 university students in China. A four-point Likert scale is used in the McVay survey with the following choices ranging from 1 to 4 respectively: rarely, sometimes, most of the time, and all of the time.

The questionnaire was delivered electronically and students were asked to go to the survey hosting website and complete the survey. An on-ground instructor conducting the courses administered the survey to ensure participant understanding and to instill confidence of legitimacy in the online request. Question #4 on the instrument was changed from "I am willing to dedicate 8-10 hours per week for my studies" to "I am willing to dedicate the necessary time per week for my studies". The reason for this change was that a specified and dedicated time range is questionable due to the variability of cognitive ability of the learner and course load undertaken. This modification to the survey question is consistent with a previous study conducted by Atkinson and Blankenship (2010).

A factor analysis was conducted using principal components with varimax rotation. In the Atkinson et al.'s (2010) study using a smaller sample size, four factors were identified for the Chinese students. The original direction of this paper was to determine whether the Chinese university student's factor loadings would be consistent with that of the earlier Australian and U.S. studies.

Table 1 provides information about each of the survey questions as well as general statistics describing the sample.

Table 1

Chinese Student Descriptive Statistics

Questionnaire item	Gender	No.	Mean	Std. deviation
I am able to easily access the Internet as needed for my studies.	M F	38 77	2.76	0.651
I am comfortable communicating electronically.	M F	38 77	2.90	0.680
I am willing to actively communicate with my classmates and instructors electronically.	M F	37 77	2.80	0.735
4. I am willing to dedicate the necessary time per week for my studies. Previously this question was: I am willing to dedicate 8-10 hours per week for my studies.	M F	37 77	2.60	0.730
5. I feel that online learning is of at least equal quality to traditional classroom learning.	M F	38 77	2.42	0.714
6. I feel that my background and experience will be beneficial to my studies.	M F	38 77	2.78	0.754
7. I am comfortable with written communication.	M F	37 77	2.64	0.724
8. When it comes to learning and studying, I m a self-directed person.	M F	38 76	2.61	0.655
9. I believe looking back on what I've learned in a course will help me to remember later.	M F	38 77	2.95	0.686
10. In my studies, I am self-disciplined and find it easy to set aside reading and homework time.	M F	37 76	2.53	0.644
11. I am able to manage my study time effectively and easily complete assignments on time.	M F	38 77	2.74	0.640
12. As a student I enjoy working independently.	M F	38 77	2.82	0.761
13. In my studies, I set goals and have a high degree of initiative.	M F	37 77	2.70	0.689

Factor Analysis

This study used as a foundation, the findings of Smith (2003), Smith (2005), and Atkinson and Blankenship (2010). Principal components analysis with varimax rotation was performed. Factor loadings of 0.4 were adopted since this was used in the previous research as well. Smith (2005) stated that factor loadings of 0.4 or more was more stringent than required by other researchers who recommend a value of 0.32 or higher. If an item loaded highly on each factor, the item was assigned to the factor that it loaded the highest on. Using a Scree plot and an Eigen value greater than one, a four-factor solution was selected. These four factors accounted for 59.343% of the variance. The loadings are shown in Table 2 for each of the four identified factors. Factor one remains identified as self-management of learning, and factor 2 remains comfort with non face-to-face communication.

Results

Table 2

Factor 1 Loadings of Questionnaire Items for 2010 China Study

Factor	1	2	3	4
Eigenvalue	2.799	1.974	1.657	1.285
% of variance	21.529%	15.183%	12.746%	9.885%
Questionnaire item				
1. I am able to easily access the Internet as needed for my studies	0.101	0.299	0.541	0.194
2. I am comfortable communicating electronically.	0.072	0.856	0.154	0.158
3. I am willing to actively communicate with my classmates and instructors electronically.	0.142	0.768	0.193	0.085
4. I am willing to dedicate the necessary time per week for my studies. Previously this question was: I am willing to dedicate 8-10 hours per week for my studies	0.650	-0.020	0.066	0.130
5. I feel that online learning is of at least equal quality to traditional classroom learning.	-0.012	0.030	0.773	0.097
6. I feel that my background and experience will be beneficial to my studies.	-0.044	0.405	0.111	0.720
7. I am comfortable with written communication.	0.496	-0.017	0.053	0.713
8. When it comes to learning and studying, I m a self directed person.	0.335	0.156	0.678	-0.064
9. I believe looking back on what I've learned in a course will help me to remember later.	0.632	0.429	-0.075	-0.196
10. In my studies, I am self disciplined and find it easy to set aside reading and homework time.	0.745	-0.022	0.242	0.252
11. I am able to manage my study time effectively and easily complete assignments on time	0.724	0.141	0.086	0.057
12. As a student I enjoy working independently.	0.475	0.121	0.370	-0.157
13. In my studies, I set goals and have a high degree of initiative.	0.524	0.392	0.135	0.169

In the Atkinson et al.'s (2010) study, factor 3 is labeled as "self-initiated communication". This seems to capture the essence of the factor 3. It is helpful to work from the bottom upward to assess the appropriateness of this factor label. Item 10 states, "In my studies, I am self-disciplined and find it easy to set aside reading and homework time". Similarly, item 13 states, "In my studies, I set goals and have a high degree of initiative". We view this as "self-initiation" and then consider the other items having factor loadings greater than 0.4. Items 1, 2, 7, and 10 intimate students comfort with various forms of communication such as internet (item 1), electronic (item 2), written (item 7) communication. Together with the self-initiation items (items 10 and 13), labeling this previously unidentified factor as "self-initiated communication" appears reasonable. Factor 4 is labeled as

"self-directed discipline". Again, working from the bottom to the top of the factor items is helpful. Item 10 deals with self-discipline, item 8 with self-direction, and item 5 with perceptions of quality. Implicit in our label of "self-directed discipline" is the idea that students who are self-directed, possess the self-discipline to autonomously complete tasks in an online learning environment and will also feel at least partially responsible for the quality of the learning process as indicated in item 5.

Discussion

To accurately describe the situation in China, it only makes sense to request the instructor on-ground to contextualize the facts as observed. First, it is important to note that all students that participated in this study were undergraduates, and academic disciplines ranged from English to engineering with numerous other majors represented. English is required of nearly all majors as a supplement to the main coursework. Internet access in China is very widespread. There are internet cafes on almost every corner. These cafes are shops with rows of computers that can be rented by the hour, usually with a card system where money is funded on the card along with a personal password, and deducted as they use computer time. The graduate student that actively administered the survey instrument has toured most provinces via motorcycle and logged over 25,000 km. From his experience there seem to be internet cafes anywhere there is electricity which includes remote areas in Tibet. This was true even at 13,000 feet above sea level in the Himalayas in a mud patch village where the power is only available for a few hours, and only at night. Mr. Bourassa is that graduate student and has first-hand experience teaching in China. The following are excerpts of some of his observations.

> It is really unbelievable. And it must be affordable enough (usually price ranges from 5 cents to 25 cents an hour, depending on how upscale the cafe is, and how remote the town, and how much money you put on the card at a time), because they are open 24 hours a day and filled with local kids. A majority of these internet users are from 13-27 in my estimation, and a vast majority are playing (addicted) to computer games. They play things like MMORPG's, World of Warcraft, Counter Strike (first person shooters), and dancing/music games (kind of like Rock Band but with a keyboard and making a character dance).

> To answer whether or not the school provides internet access, this depends on the school. Many schools I worked at provided internet access in a few ways. One of the wealthier schools provided computers in the dormitory, but the bandwidth was so slim that they could not access much of anything except the school's intranet. When I assigned them to get onto an American website for practicing English (a website that was all text, no video or pictures), they all told me it was too slow to use reasonably.

> Many schools provided internet connections in dorm rooms and the kids had to get their own computers, but depending on the school, many could not afford. The common undergrad dorm puts from 6-10 students in a single room (bunk beds lining each wall, and maybe one desk for the whole group... the room being about 10'×20' with a small bathroom attached (VERY tight quarters). Often, the students families pitched in to have one computer for the group, but still, they usually just used it for music and gaming (not online gaming though, as it was too slow).

> Most schools have "computer labs", where they have a few rooms with 20-40 computers of decent quality, and the students get occasional classes in those rooms to teach basic computer skills. (but they already know computers because they ALL (at least 97-98%) use internet cafe's to email, chat, and play games. It's a major addiction in China. No matter how poor, everyone has a cell phone, and everyone plays computer games and online chats at internet cafe's).

> The issue of whether or not the school provides computers is almost irrelevant, because computer access is TOTALLY available to all Chinese, at a cost that they can surely afford because they are already using the computers for the gaming. I should add here that I taught in a variety of cities, from first tier (capital of Shandong Province, Jinan city), to countryside,

but never in the top class, westernized cities. In cities like Beijing, Shanghai, Guangzhou, Tianjin, Shenzhen, Hangzhou, and a few others, they are so much more advanced and westernized than the rest of China, that I would say that 95% of those students have computers in their homes with fast internet access. (I worked in advertising in Shanghai and had friends who taught at a few universities, and they said that they gave internet based homework to students, and that it was standard).

Internet access is TOTALLY available to every student in China. The students surely went to an internet cafe to take the survey. A few may have taken it from their dorm room if their internet connection was good enough to access the site fast enough.

To answer if there are any internet sites blocked in China, this is complicated. There are more and more foreign sites blocked every day. You would be able to understand much better than I about how this works considering your expertise, but I'll try and sum up what I can from all the things I have heard and experienced.

First, they will block any major sites that end up showing anything politically controversial. YouTube® was blocked a while back because videos were posted of soldiers beating monks. Some of these videos were evidently shown to be clips taken from a movie, but some were supposedly real live footage. Facebook was blocked more recently because of videos posted about the uprising in Xinjiang (northwestern most province of China) by the Muslim population there (There was a police state for a while, people got killed, and internet and phone service was shut down completely for a few weeks. Facebook remained blocked in all of China since then).

Next, more broadly, the Great Firewall seems to indiscriminately block a number of foreign sites. I made a web page for myself as sort of an online resume where prospective employers can get to know me, see my credentials, download my resume, letters of recommendation, etc.. This site is not accessible in China. I went through 4 different ISP's [Internet Service Providers], and all were blocked. Their explanation to me is that ISP's use a range of IP addresses, and if any one page has any controversial content, China will just block the whole range. (I really don't know what this means, but that's what I recall their explanation being). I had a lot of back and forth with a number of tech people at these ISP's, and they didn't know the pattern or logic as to why some sites are blocked and others aren't. If you get a dedicated IP, which is MUCH more expensive, they claim that should not be blocked, but I was not willing to spend the money to find out just for a minor resume site.

I never had any problems accessing my coursework, WKU websites, Course Smart (online textbook site), Connect (McGraw Hill site), etc., when I was in China. I think if you are running a legit educational site with a dedicated IP, there should be no problem. I can do proper research all about the Great Firewall, with references, etc., and get a more formal report written on this issue.

The internet infrastructure is widespread. VERY widespread. China is WIRED. I was up in the Himalayas in Tibet on a motorcycle tour where you would drive 6 hours without seeing even a village, and my cell phone worked the whole way, and when you did get to a village, they had internet cafes. Truly amazing (I think they keep it so wired so that the police and army there always have access to communication.

When I'm on a tour and I ride into a new town and I need to use the internet, I just walk out of my hotel room and start strolling down the street and there will be one within a block or two in any direction. No need to even ask where one is. They are everywhere.

We hope these excerpts will give the reader a sense of what online educational opportunities exist for Chinese students and the difficulty those students may have accessing information over the internet.

Limitations, Further Research Needs, and Conclusions

The McVay Questionnaire is written in English and, of course, the students in China have Chinese as their first language. However, all Chinese students who completed the survey spoke English. Additionally, the individual administering the survey in China was an English professor who is completely fluent in both English and Chinese and could thus assist students with any question they may have had about the survey items.

The items in the McVay Online Readiness Survey has been shown to be consistent on loading highly on two factors for Australian and US students and is currently being used in conjunction with a pre-test and post-test assessment instrument in online courses with an effort to further validate the instruments level of effectiveness.The model for effective online learning among Chinese students would appear to be quite different than that of their western counterparts based upon the loadings. While there are common factors involved, additional research is needed to refine that way international students interpret the topics covered by the questions in the McVay Questionnaire.

References

Anitsal, M., Anitsal, I., Barger, B., Fidan, I., & Allen, M. (2008). Student evaluations of course attributes of online courses versus on-ground courses: Impact of student personality traits. *Allied Academies International Conference. Academy of Marketing Studies. Proceedings, 13*(1), 1-8.

Atkinson, J. K., & Blankenship, R. (2010). Online learning readiness of undergraduate college students: A comparison between male and female students. *The Journal of Learning in Higher Education, 5*(2).

Atkinson, J. K., Blankenship, R., & Droege, S. (2010). College student online learning readiness: A comparison of students in the U.S.A.. Australia and China To appear in *The International Journal of Global Management Studies*.

Cao, Q., Griffin, T. E., & Bai, X. (2009). The importance of synchronous interaction for student satisfaction with course web sites. *Journal of Information Systems Education, 20*(3), 331-338.

Chen, C. (2007). The effect of organizational change readiness on organizational learning and business management performance. *The Business Review, Cambridge, 8*(2), 68-74.

Chen, L., Chen, H. N., & Wang, N. (2009). Distance education in China: The current state of e-learning. *Campus-Wide Information Systems, 26*(2), 82-89.

Covin, J. G., & Slevin, D. P. (1986). The development and testing of an organizational-level entrepreneurship scale. In R. Ronstadt, J. A. Hornaday, R. Peterson, & K. H. Vespar (Eds.), *Frontiers of entrepreneurship research* (pp. 628-639). Wellseley, M.A.: Babson College.

Feng, D. (2003). Principal training and development in the People's Republic of China: Retrospectand prospect. In P. Hallinger, (Ed.), *Reshaping the landscape of school leadership development: A global perspective* (pp. 206-216). Swets & Zeitlinger, Lisse.

Knowles, M. S. (1968). Andragogy, not pedagogy. *Adult Leadership, 16*(10), 350-352, 386.

Knowles, M. S. (1973). *The adult learner: A neglected species* (revised). Houston: Gulf Publishing Company.

Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. Englewood Cliffs: Prentice Hall/Cambridge.

Kulchitsky, J. D. (2008). High-tech versus high-touch education: Perceptions of risk in distance learning. *The International Journal of Educational Ma,nagement, 22*(2), 151-167.

Lever, J., Gerlich, N., & Pearson, T. (2006). Market segmentation for online courses in the college of business. *Academy of Marketing Studies Journal, 10*(2), 95-105.

Manolova, T. S., Eunni, R. V., & Gyoshev, B. S. (2008). Institutional environments for entrepreneurship: Evidence from emerging economies in Europe. *Entrepreneurship Theory and Practice, 32*(1), 203-218.

McVay, M. (2000). *How to be a successful distance learning student* (2nd ed.). Needham Heights, M.A.: Pearson Publishing.

McVay, M. (2001). How to be a successful distance education student: Learning on the internet. New York, N.Y.: Prentice Hall.

Mitchell, A., & Honore, S. (2007). Criteria for successful blended learning. *Industrial and Commercial Training, 39*(3), 143-149.

Santhanam, R. (2001). The effects of communication modality on outcomes of collaborative tasks. *Information Technology and Management, 2*(4), 377-394.

Scott, W. R. (2008). *Institutions and organizations: Ideas and interests* (3rd ed.). Sage Publications.

Selim, H. M. (2005). Critical success factors doe e-learning acceptance: Confirmatory factor models. *Computers and Education, 9*(2). 396-413.

Smith, P. J. (2005). Learning preferences and readiness for online learning. *Educational Psychology, 25*(1), 3-12.

Smith, P. J., Murphy, K. L., & Mahoney, S. E. (2003). Identifying factors underlying readiness for online learning: An exploratory study. *Distance Education, 24,* 57-68.

Wang, Q. Y., Zhu, Z. T., Chen, L., & Yan, H. B. (2009). E-learning in China. *Campus—Wide Information Systems, 26*(2), 77-81.

Womble, J. (2008). The relationship among learner satisfaction, self-efficacy, and usefulness. *The Business Review, Cambridge, 10*(1), 182-188.

Yan, W., & Lisa, C. E. (2009). Principal preparation and training: A look at China and its issues. *The International Journal of Educational Management, 23*(1), 51-64.