A study on Teacher's Self-efficacy for promoting ICT integrated Education in primary school in Mongolia

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Abstract

Use of the Information Communication Technology (ICT) in education has been received more attention for improving a quality of education, and this is no exception in Mongolia. This study investigates the current climate of ICT integrated education in Mongolia through a lens of teachers' self-efficacy. The data were collected from 838 primary school teachers in Mongolia. The pairwise correlation coefficient was calculated to assess the relationships between three types of perceived self-efficacy (confidence, competency and satisfaction.) and two education aspects, teacher training activities and practical ICT experience at school level. The study found that perceived influence of school-based trainings had the strongest correlation among teacher training activities. It also found that positive institutional attitude toward ICT integrated education is vital to teacher's self-efficacy. Based on the findings, following points were implied to increase or maintain teacher's higher self-efficacy: 1) school-based teacher training activities, especially related to ICT integrated education, should be given a priority; and 2) sessions to understand the pedagogical value of ICT should be included in management level trainings.

Introduction

A trend in ICT development

With the introduction of the information and communication technology (ICT), the way of accessing, organizing, and sharing information and knowledge has dramatically changed, especially in the past two decades. As a result, the ways of teaching in school have been also affected (Arnseth & Hatlevik, 2010). In the past Millennium Development Goals (MDGs)[1], the development of the collaborations related to ICT was placed on of the most important goals in the 8th goal, and it was also expected to play important role to achieve target goals in all areas of MDGs. In the post-2015 development agenda, ICT is continued to be expected to play even more important and specific roles (United Nations, 2014; United Nations ICT Task Force, 2003). This has become more evident as the enhancement of ICT was placed as one of the targets in four Sustainable Development

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[1] The Goal 8, Develop a Global Partnership for Development, includes 7 targets (Target 12-18). Target 18 reads "In co-operation with the private sector, make available the benefits of new technologies, especially information and communication" (United Nations ICT Task Force, 2003)

Goals (SDGs)[2] (United Nations, 2016). The development of ICT skill is a crucial factor, in terms of building citizen's skills and competencies. In fact, the ICT skills are considered as one of the core skills for living in the 21st century.

In recent years, the use of ICT in education has been greatly emphasized, because of its various potentials to contribute in education practices. For example, ICT can contribute to improve access and equity in education, teachers' professional development, and efficient administrative management (UNESCO, Unknown). One of the important roles and expectations of ICT integrated education is to improve quality of learning and teaching (Hepp, Hinostroza, Laval, & Rehbein, 2004; UNESCO, Unknown). Although the degree of positive impact of ICT integrated education may vary in different contexts, a number of studies support the positive relationship between ICT integrate education and quality of education (Hepp, et al., 2004). For example, a study found that the teachers' openness to change, especially in the careful planning on the teacher's role using ICT, influence students' learning both in content acquisitions and critical thinking skills (Baylor & Ritchie, 2001). Integrating ICT in education is especially important for low-income and isolated rural schools since it can enhance their learning tools and resources, as well as it enables students to connect to outside of the community (Hepp, et al., 2004).

ICT development in social sector in Mongolia

The increasing demand for advancing ICT development is no exception in Mongolia. In early 1990's, ICT industry was led by the private sector in Mongolia after the transition from the planned market economy (Doodewaard, 2004). In 2000, Mongolian parliament ratified "ICT-Vision 2010" as a blueprint of the ICT strategy. According to the governmental review of their achievements in ICT development[3], more than 85% of their target goals is met by 2010, and further policy recommendations were developed based on their analysis, such as the ICT Vision-2021 (ICTPA of Mongolia, 2011). In fact, the development of ICT in Mongolia was evident. For example, the number of internet subscribers was dramatically increased within 5 years; 22,000 internet subscribers in 2005 had increased to 106,000 in 2009, which is almost five times increase in 4 years. Moreover, the subscription number almost doubled to 199,800 in 2010 (ICTPA of Mongolia, 2011). Such development was reflected in the international indicators as well. ICT development Index (IDI) of Mongolia has improved rapidly and ranked one of "the most dynamically improved countries between 2011 and 2012" (International

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[2] The four SDGs setting ICT as a target are: 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (4.b); 5. Achieve gender equality and empower all women and girls (5.b); 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (9.c); and 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development –Technology (17.8) (United Nations, 2016).

[3] Achievement scores and reviewed documents by the government are: 92.7% for "Mid-term strategy to develop ICT by year 2010", 88% for "Concept to develop ICT in Mongolia by year 2010", and 85.7% "E-Mongolia national Program" (ICTPA of Mongolia, 2011).

Telecommunication Union, 2013).

Under these governmental initiatives, education has become one of the target sectors to achieve "efficient ICT integration" (Doodewaard, 2004; InfoCon, unkonwn; Uyanga, 2006). The "ICT Vision 2010 in Education Sector of Mongolia" was developed by the Ministry of Education Culture and Science (MECS). Its action plans include important strategies, such as expanding access to the information network for education, creating a system to build ICT/computer literacy, and enhancing ICT specialists in the education sector (Narantuya, 2007). Since 2006, the MECS has been implementing "Framework for Incorporating ICT in Primary and Secondary education sector 2015", which aims to establish e-network, develop e-infrastructure, and invest in human capital and flexible training system to fully integrate ICT in schools by 2015 (UNESCO Office Beijing, 2008). Responding to these initiatives, the use of ICT in education has received attention as an important tool for improving the quality of education as well as promoting sustainable capacity-building in Mongolia (Sukhbaatar, Yamaguchi, Takada, Bat-Erdene, & Orgilmaa, 2012). However, the environment for fully utilizing the ICT for teaching has not yet implemented completely (Oyun, 2014). The reasons behind such conditions are not only infrastructural factors, for instance, lack of equipment, but also capacity related factors, insufficient knowledge and experience of using ICT in education practices (Doodewaard, 2004; UNESCO Office Beijing, 2008).

Significance and scope of the study

When promoting the use of ICT in education in developing areas, past studies mainly investigated external factors, including ICT policies, availability of the infrastructure, and equipment/software. However, Hepp and his colleagues (2004) claim that focusing on only external factors do not produce meaningful results nor the expected impacts on student's learning. In other words, enhancing internal factors of those who use ICT is also important. In fact, multiple studies claim that understanding internal factors, such as teachers' belief, is a critical component for education research (Nespor, 1987; Pajares, 1992; Ross, 1992). This study, therefore, investigates one of the internal factors related to ICT integrated education, teacher's self-efficacy. Self-efficacy is a belief or judgment of own capability to execute given type of performance, and it influences if people think erratically or strategically, optimistically or pessimistically in a specific context (Bandura, 2006). The belief in their capacity working effectively in the classroom is relevant to determine how teachers organize and define their teaching activities, hence, a quality of education (Albion, 1999). In Mongolian context, majority studies are still focusing on external factors. Especially studies related to teachers' self-efficacy in Mongolian context are limited. This study, therefore, looks at the ICT integrated education through the lens of teacher's self-efficacy. It intends to identify educational practice related to self-efficacy of the primary school teachers in Mongolia.

Theoretical Frameworks

Social cognitive theory and Self-efficacy

Social cognitive theory explains that human functioning results from reciprocal determinates of 1) personal factors (cognition, affects, and biological events), 2) behaviors, and 3) environmental influence. This theory is rooted in the view of which human can largely determine the outcomes by proactively choosing and engaging in the development for a desirable outcome (Schunk & Pajares, 2009). In other words, self-influences have an effect on the selection and construction of one's environment. In social cognitive theory, self-efficacy is considered to influence behavior and environment. Beliefs on self-efficacy regulate human behavior through cognitive, motivational, affective and decisional processes (Bandura, 1993; Benight & Bandura, 2004). The theory claims that perceived self-efficacy plays a key role to contribute to motivation and behavioral change; i.e., the higher the perceived self-efficacy individual have, he/she tends to sets higher goals, expands more efforts, perseveres more on challenges, and becomes more resilient to failures (Bandura, 1991, 1993; Bandura & Adams, 1977). Schunk and Pajares (2009) explain that self-efficacy is a key determinant of individuals' motivation, learning, self-regulation, and achievement. It has a direct impact on one's behavior since it helps determine what extent he/she wants to make efforts, to persevere when confronting obstacle, and to be resilient when facing adverse situations (Schunk & Pajares, 2009). The perceived self-efficacy determine not only the level of effort, but also its quality, i.e., how productively that effort is deployed. Therefore, higher perceived self-efficacy brings about various motivated efforts and it enable to enhance performances (Bandura, 1991, 1993; Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Harrison, Rainer, Hochwarter, & Thompson, 1997).

Figure 1: The influence of self-efficacy on behaviors and performance
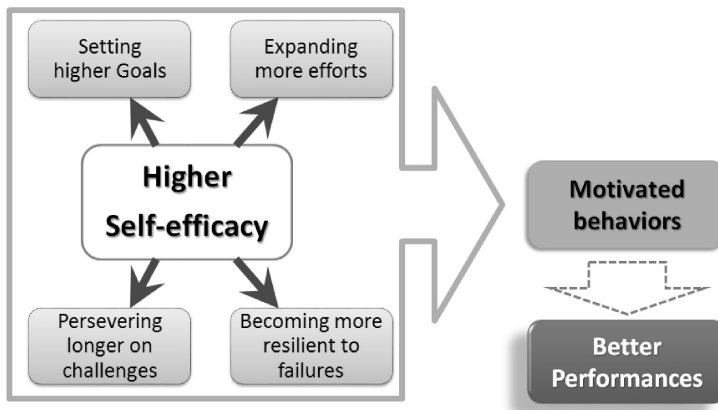
Source adapted;(Bandura, 1991, 1993; Bandura, et al., 2001; Harrison, et al., 1997)

This mechanism also can be applied to education context. For example, students' self-belief in their efficacy to regulate own learning and to master academic activities determines their level of motivation, hence, their academic achievements. As for teachers, their self-efficacy to motivate students' learning has an impact on creating effective students learning environments; thus, their students' academic progress (Bandura, 1993). For example, teachers with higher self-efficacy tend to develop challenging activities, to help students succeed, and to persist with students having difficulties (Schunk, 1995; Schunk & Pajares, 2009). Moreover, the collective self-efficacy of school professionals bears a positive relation to the achievement of students in the school and teachers' job satisfaction (Bandura, 1993; Schunk & Pajares, 2009). For these reasons, increasing or maintaining teachers' high self-efficacy can be an important policy strategy to motivate teachers, in turn, to promote quality education.

Self-efficacy and ICT integrated education

Improving education quality is not a simple task. It is a consolidated result of multiple educational efforts and practices, including, teaching methods, infrastructure, policy-making, and financial and/or technical support from government. Among these factors, "teachers" is one of the most important factor, because they are the one who blend all the educational components together to deliver environments for teaching and learning (Bandura, 1993; Harding, 2012). Sherman and Howard (2012) further emphasize the importance of teachers' belief for making decisions to integrate ICT in their educational activities. However, merely encouraging teachers to use ICT in daily educational practices does not realize ICT integrated education. The several internal factors of teachers should be considered, such as knowledge and skills, self-efficacy, and belief in its pedagogical value (Ertmer & Ottenbreit-Leftwich, 2010). Ertmer and Ottenbreit-Leftwich (2010) stress that having knowledge and skills is not enough to change teachers' behavior, unless they feel confident to facilitate student learning through those gained ICT knowledge and skills. They further claim that self-efficacy may be more important factor to implement technology in their classrooms. For these reasons, enhancing teachers' self-efficacy, especially ones related to ICT use, can play important roles to bring about the change in the education practice.

Methodology

Samples

The quantitative data were retrieved from the baseline survey on "Quality Improvement of Primary Education Teachers through Development of Training Materials Using ICT", which was conducted in 2012. Stratified sampling was employed. First, four geographical regions are identified to cover various characteristics of the country, and the four provinces (aimags) were selected from each geographical area (Khovd, Bayankhongor, Selenge, and Khentii). In addition, two districts from Ulaanbaatar (UB)

city, reflecting different socioeconomic status, were included to this study. The Education and Culture Departments (ECD) of each province and two districts from UB city, collected data through questionnaires from at least 10 schools within the area.

Data collection was conducted from December 2012 to January 2013. A total of 838 primary school teachers responded to the survey, which account for 8.3% of total primary education teachers in Mongolia (Mon-Educ Consulting LLC, 2012). More than 95% of teachers were female, and the mean of the teachers' age was 37.9 years old ($SD = 8.86$). The mean of the years of service as a teacher was 15.8 years old ($SD = 9.88$). As for the school locations of the participated teachers, 41% were from UB city, 32% were from province centers, and 27% were from in villages.

In addition, qualitative data were collected through the focus group discussions in order to explore the perceptions of the primary school teachers, especially on the issues around teachers' self-efficacy. The discussions took place in Bayankhongor aimag in September 2014, during aimag level teacher training workshop. A total of 37 teachers, out of 50 participants of the workshop joined in the discussions in two different groups. The discussions were conducted based on a semi-structural and open-ended question, focusing on following points; 1) the relationships between the successful teachers and teachers' perceived self-efficacy; 2) the relationships between ICT integrated education and teachers'' perceived self-efficacy.

Measures
Dependent variables: Self-efficacy

Self-efficacy is a belief in their capabilities to mobilize their own motivation, cognitive resource and necessary actions. It is a judgement of capability to execute task-specific performance (Bandura, 2006; Wood & Bandura, 1989). With this respect, three types of domains were included to measure self-efficacy of teachers. The first domain is perceived confidence. Three question items measuring how confident a teacher is to be trusted and considered to be a good teacher were included in this domain. The second domain is teachers' perceived competency. Six question items are included to measure what extent a teacher feels professionally competent in different educational settings. The third domain representing teachers' perceived satisfaction. This domain assesses how satisfied he/she is as a teacher in various teaching contexts, and six question items are related to this domain. A four-point Likert scale was employed to measure each question with higher scores indicating higher self-efficacy. After eliminating samples with missing values, the total self-efficacy scores were calculated separately for each domain, and following valid samples were yield: 536 samples in Confidence domain, 590 samples in Competency domain, and 578 samples in Satisfaction domain.

The mean scores and standard deviation of valid samples of each self-efficacy measures are summarized in Table 1.

Table 1: Descriptive results of self-efficacy domains

Self-Efficacy	Valid N	Minimum	Maximum	Mean	Std. Deviation
Confidence	536	3.00	12.00	8.89	1.89
Competency	590	6.00	24.00	18.02	3.54
Satisfaction	578	7.00	24.00	18.06	3.52

Independent variables

In order to examine related educational practices to perceived self-efficacy, the questionnaire was carefully reviewed reflecting previous studies conducted in Mongolian educational context (Li, 2015; Oyun, 2014). In this study, two aspects of education practices are selected for the investigation: teacher training activities and practical ICT experience at school level. The first aspect, teacher training activities, includes seven question items which assess the frequencies of teacher training participation (local and school-based), and perceived influence of the teacher training activities, which contribute to their ICT expertise; the aspect includes different levels of teacher trainings (national, local, and school-based), as well as peer-learnings, and self-studies. The second aspect, practical ICT experience at school level, contains eight question items. It explores frequencies of ICT use in education activities and current school practice related to ICT use, including school policies and implementation systems. It also assesses the perceived freedom to integrate ICT, ability to use digital teaching aide, and the support of ICT use from the management for better teaching. Therefore, a total of 15 question items within two education aspects are used as independent variables to investigate the relationships to each self-efficacy domains.

Data Analysis Procedure

The pairwise correlation analysis was employed. The Pearson product-moment correlations coefficient was calculated to assess the relationships between each self-efficacy domain and question items mentioned above. The result of correlation analysis was supplemented by the qualitative data for further interpretations in order to add a depth in the analysis.

Data Analysis and Results

This section summarizes the data analysis and interprets the results according to the two aspects, namely, teacher training activities and practical ICT experience at school level.

Techer training activities

A total of seven question items related to teacher training activities are included to find the relationships with perceived self-efficacy domains, confidence, competency, and

satisfaction. In confidence domain, while the frequencies of the training participations are not statistically significant, the perceived influence of training activities at all three levels (national, local, school-based), as well as peer-learnings and self-studies are positively correlated. Particularly, the relationship between teacher' confidence and the school-based training shows the strongest correlations among the examined training activities (r(487)=.31, p<.01). It may imply that effective school based trainings can positively influence to teacher's confidence.

For the perceived competency, all seven question items, both frequencies and perceived influence of the teacher training activities, are positively correlated. The result indicates that the perceived influence of local and school-based teacher training activates show especially stronger correlations, (at local level: r(457)=.33, p<.001, school-based level : r(518)=.35, p<.01). It can be interpreted that various teacher training activities are related to teachers' higher perceived competency; however, formally organize training activities are more effective.

In the domain of perceived satisfaction and all seven question items are also positively correlated. The perceived influence of the school-based training indicated the strongest correlation (r(508)=.32, p<.01). The finding also suggested the school based training is an effective training activities for teacher's satisfaction.

Table 2: Correlation Results between Self-efficacy and Teacher Training Activities

Teacher Training Activities			Confidence	Competency	Satisfaction
1	How many times did you participate in aimag/district level teacher training during last academic year (from September 2011- to September 2012)?	r	.053	**.110****	**.140****
		Sig.	.234	.009	.001
		N	502	557	542
2	How many times did you participate in school-based teacher training during last academic year (from September 2011- to September 2012)?	r	.086	**.164****	**.150****
		Sig.	.054	.000	.000
		N	500	553	540
3	How much, or how little, have the following activities influenced the development of your expertise in ICT / Training in UB	r	**.218****	**.275****	**.283****
		Sig.	.000	.000	.000
		N	349	362	351
4	How much, or how little, have the following activities influenced the development of your expertise in ICT / Training at ECD	r	**.260****	**.331****	**.295****
		Sig.	.000	.000	.000
		N	430	457	443
5	How much, or how little, have the following activities influenced the development of your expertise in ICT / School-based training	r	**.313****	**.348****	**.317****
		Sig.	.000	.000	.000
		N	487	518	508

6	How much, or how little, have the following activities influenced the development of your expertise in ICT / Colleagues/other teachers	r	.211**	.286**	.234**
		Sig.	.000	.000	.000
		N	462	486	476
7	How much, or how little, have the following activities influenced the development of your expertise in ICT / Self-studies	r	.198**	.253**	.211**
		Sig.	.000	.000	.000
		N	449	473	465

**Correlation is significant at the 0.01 level (2-tailed)

In summary, three major findings were identified. First, the different strength of the relationships is found between the frequency of the participation and the perceived influence of the teacher training activities. In all three self-efficacy domains, the perceived influences of the teacher training activities are correlated stronger than the frequency of the participation. In other words, how a teacher feels about the experiences of the training activities, i.e., its qualities, are more important to possess a higher self-efficacy than quantity of the teacher training activities.

Second, among the perceived influence of teacher training activities, the school-based trainings had the strongest correlation with all three domains of self-efficacy. As shown on Table 2 above, the training activities organized by local government level have stronger correlations compared to the national level; however, the school-based training activities have even stronger correlations to all three self-efficacy domains. This finding can be interpreted that training activities reflecting local needs with school level educational practice are closely related to teacher's confidence, competency, and satisfaction.

Third, both peer-learnings and self-studies are correlated to all three domains of self-efficacy, however, peer-learnings shows relatively stronger correlations in all self-efficacy domains. This point was supported during the focus group discussion. Multiple teachers agreed that collaboration with colleagues does influence their self-efficacy

In addition, it is worth mentioning that the qualitative data confirmed the importance of the teacher training activities for their self-efficacy. Discussion among teachers revealed that acquiring skills and knowledge is vital for developing their confidence. It enables teachers perform better. This point was also agreed by a training manager who plans and coordinate daily teacher training activities.

Practical ICT experience at school level

A total of eight question items related to practical ICT experience at school level are examined to find the relationships with three domains of perceived self-efficacy. For the perceived confidence, the support from school management on understanding better teaching with ICT use was strongly correlated ($r(518)=.54$, $p<.01$). Further, having clear pedagogical goals for the ICT initiative ($r(516)=.49$, $p<.01$), and having systematic ways

to develop ICT integrated lesson (r(501)=.43, p<. 01) also indicate stronger correlations. It illustrates that a positive attitude toward ICT integrated education at the institutional level is related to the higher perceived confidence of teachers.

In the domain of perceived competency, having clear pedagogical goals for the ICT initiative indicates strongest correlation (r(521)=.45, p<. 01). Moreover, ability to use subject specific digital teaching aids in the teaching (r(521)=.43, p<. 01), and having systematic ways to develop ICT integrated lesson showed stronger correlations (r(510)=.412, p<. 01). This can be interpreted teachers who have been using ICT in their teaching has higher perceived competency

As for the perceived satisfaction, having clear pedagogical goals on the ICT initiative has the strongest correlation (r(515)=.43, p<. 01), followed by the support from management on understanding better teaching with ICT use (r(530)=.40, p<. 01), and having systematic ways to develop ICT integrated lesson (r(511)=.40, p<. 01). It may be suggested those who working in the school condition where the support of ICT integration in teaching through educational goals and management support have higher perceived satisfaction.

Table 3: Correlation Results between Self-efficacy and practical ICT experience at school level

practic al ICT experience at school level		Confidence	Competency	Satisfaction
1	How often do you use ICT when doing the following? -- Teaching/lecturing	r	**.167****	**.274****	**.266****
		Sig.	.000	.000	.000
		N	486	523	518
2	How often do you use ICT when doing the following? -- Group work, projects	r	**.181****	**.252****	**.241****
		Sig.	.000	.000	.000
		N	462	507	498
3	There are clear pedagogical goals for the schools ICT initiative	r	**.491****	**.450****	**.433****
		Sig.	.000	.000	.000
		N	516	521	515
4	There is a systematic sharing of pedagogical experience in use of ICT	r	**.383****	**.405****	**.373****
		Sig.	.000	.000	.000
		N	519	540	532
5	We work in a systematic way to develop teaching based on ICT	r	**.425****	**.412****	**.399****
		Sig.	.000	.000	.000
		N	501	510	511
6	I am allowed to use ICT to improve my teaching	r	**.365****	**.292****	**.323****
		Sig.	.000	.000	.000
		N	531	549	544

7	I can use subject-specific digital teaching aids in my teaching	r	.403**	.432**	.393**
		Sig.	.000	.000	.000
		N	501	521	509
8	School management supports us in understanding how the use of ICT can improve teaching	r	.543**	.399**	.403**
		Sig.	.000	.000	.000
		N	518	538	530

**Correlation is significant at the 0.01 level (2-tailed)

In summary, three major findings were identified. Frist, the positive institutional attitude toward ICT integrated education is associated with teacher's higher self-efficacy. The positive attitude can be embedded in policies, implementation systems, and/or encouragement within a school culture. These have stronger relationships with self-efficacy when compared with the frequencies of using ICT.

Second, having clear pedagogical goals on ICT initiative is vital for the teachers to develop higher levels of self-efficacy. The study found that pedagogical goal setting has stronger relationship with all three domains of confidence, competency, and satisfaction.

Third, the systematic implementation of the ICT use, both for developing lessons and for sharing pedagogical experiences, are significantly correlated with teacher's self-efficacy. The result indicated that having a systematic implementation, especially for developing lesson is important.

The qualitative data also confirmed that the use of ICT enable teachers to feel more confident, since they can find new and better resource and utilize them in the classroom. During the focus group discussion, one teacher stated that the higher self-efficacy makes teachers to conduct more ICT-based lessons, because they believe they are competent. In such situations, teachers are willing to make an extra effort to create innovative lessons using ICT in order to realize better teaching and learning.

The focus group discussion also revealed an interesting point about the relationship between ICT use and teachers' self-efficacy. Most teachers agreed on the existence of its relationships; however, the opinions on the causal relationship varied. While some teachers believed that they use ICT because they have higher self-efficacy, others claimed that they have higher self-efficacy because they can use ICT. Although further investigation is necessary, there may be a reciprocal relationship between them.

Research Implications

Teachers are the core agents in planning and implementing education practices. The theory claims that teachers with higher self-efficacy are likely to innovate effective learning environments. This empirical study illustrated that both teacher training activities and practical ICT experience at school level have a significant relationship with teacher's self-efficacy, namely confidence, competency and satisfaction. Giving these findings, the

following points are implied:

1. Among different types of training activities, school based training had strongest correlations to teachers' confidence, competency, and satisfaction. In addition, the peer-learnings are also found critical for teacher's perceived self-efficacy. Thus, it is suggested that when planning teacher training programs, the priority should be given to school-based training. Activities may employ various types of exercises and practices promoting peer-learnings and sharing such experiences.

2. The positive institutional attitude toward ICT integrated education, including setting pedagogical goals, introducing systematic implementations, and providing a good understanding of ICT use in teaching, is critical to teacher's self-efficacy. Especially, the study found that the understanding pedagogical value of ICT to improve teaching at management level is significantly important for teacher's self-efficacy. For these reasons, it is a critical strategy to include training sessions for school management to provide a broad understanding of the pedagogical value of ICT in teaching. Such sessions may employ both theoretical and practical aspects of using ICT at school level. This may lead managements to proactively initiate ICT integrated education and foster motivated teachers.

Increasing or maintaining teachers' higher self-efficacy allows teachers to be creative and start new ideas for better teaching practice and to take responsibility for student learning. Moreover, teachers with higher self-efficacy tend to promote the interpersonal network that nourish and sustain their work satisfaction (Caprara, Barbaranelli, Steca, & Malone, 2006). It is an important and effective strategy for the sustainable management of schools.

This study does not offer causal relationships between the perceived self-efficacy and teacher training nor practical ICT experience at school levels. In addition, the factors examined in this study are not exclusive ones to affect teacher's self-efficacy. However, the findings of this study offer further evidence for the value of increasing teacher's self-efficacy in order to improve a quality of education through the ICT use.

Concluding Remarks

In the past decade, the education sector has been placed as one of the most important sectors to achieve efficient ICT integration in Mongolia. It has been suggested that not only external factors, but also internal factors, such as investing in human capital, are a critical component for the development strategies. This study is intended to contribute to the knowledge base on internal factor of the ICT integrated education, teacher's self-efficacy, in Mongolian context, as studies are only limited regardless of its importance.

Giving this situation, this study looked at two aspects of education practices, teacher training activities and practical ICT experiences at school level, and investigated their

relationships to three domains of perceived self-efficacy, confidence, competency, and satisfaction, within the primary school teachers in Mongolia. The study found that school based training is associated with teacher's higher self-efficacy among different levels of teacher training activities. It also found that positive institutional attitude toward ICT integrated education is important for teacher's higher self-efficacy.

Two points are suggested as implications of the study. First, planning ICT related trainings at school level, especially employing peer-learnings, should be a priority. Second, including training sessions for school managements to provide them a broad understanding of the pedagogical value of ICT is a critical strategy.

As found in this study, training activities that reflect local needs and institutional support are vital to increase or maintain teacher's self-efficacy. Creating enjoyable and productive working environment for teachers enable them to innovate effective learning environment, hence, ultimately, will benefit to the students' achievement.

This empirical study is an important contribution to the area of ICT integrated education in Mongolia, because it covers more than 500 primary school teachers from diverse areas of the country; more importantly, it reflects real voices of these teachers in practice. The findings of this study are expected to be meaningful for planning education policies and practices in Mongolia.

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