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# Professional Development Needs of Singaporean Teachers for the 3<sup>rd</sup> ICT Master Plan

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**Abstract:** This paper reports the current implementation status of the ICT masterplan 3 in Singapore schools. The focus is on teachers' use of ICT to promote self-directed learning and collaborative learning among students in primary and secondary schools. We employed a mixed method: an online survey complemented by focus group discussions (FGDs) and interviews. The survey was administered on 50 primary and 50 secondary schools across Singapore. FGDs and interviews were conducted with teachers and school leaders from 12 participating schools. The survey indicated that teachers perceived a low use of ICT for SDL and CoL. FGDs revealed that they faced problems of time constraint, mindset issue and students' ability when delivering lessons with ICT. Interviews with school leaders indicated that teachers need to enhance their understanding of the concepts and ICT tools. In moving forward with the reform directions, we proposed professional learning community among teachers to co-construct curriculum-based usage of ICT for the two strategic foci (SDL and CoL).

**Keywords:** ICT, teachers' perception, SDL, CoL

## Introduction

The rapid advancement of information and communication technology (ICT) has led to many developed countries implementing educational reforms for the integration of ICT in education [1]. In Singapore, the Third Masterplan for ICT in Education (mp3) was launched in August 2008 to take schools forward in the use of ICT for enhancing 21<sup>st</sup> century learning. This educational reform seeks to enrich and transform the learning environments of students in Singapore schools and equip them with the critical competencies and dispositions for self-directed learning (SDL) and collaborative learning (CoL) through the effective use of ICT [2]. In the following year, a longitudinal (5 years) evaluation study was commissioned by the Ministry to assess the implementation status. The study aims to find out the possible impact of mp3 on school leaders and teachers and students as well as how schools implement mp3 and the possible contributing factors leading to the outcomes over the five years. This paper reports the findings over the first three years (2009 to 2011). The focus is on the teachers' use of ICT to promote self-directed learning and collaborative learning among students in primary and secondary schools.

## 1. Literature Review

### 1.1 *SDL and ICT*

According to Knowles [3], self-directed learning can be defined generally as a process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying resources and learning strategies, implementing the plan and evaluating outcomes. SDL stresses on personal autonomy, self management and control and the independent pursuit of learning [4]. It regards learners as responsible owners, managers and regulators of their own learning process [5]. Therefore, self-directed learners should possess various traits which include motivation, goal orientation, locus of control, self-efficacy, self-regulation and metacognition [6].

Recent research evidence has revealed that ICT is an important medium for students to develop SDL competencies. Vonderwell and Turner [7] held that online learning environment provide more control of the instruction to the learners and thereby could enhance aspects of SDL in areas such as students' responsibility and initiative towards learning. Likewise, Song and Hill [8] reported that in an online environment, self-directed learners demonstrate control, critical reflection and responsibility.

### *1.2 CoL and ICT*

Collaborative learning refers to the social process whereby students interact for the purpose of learning [9]. CoL emphasizes co-construction of knowledge within social contexts of learning such as negotiation and group processing [10]. Besides, successful collaborative learning environments entails positive interdependence and individual accountability in a group setting [11]. Technology is increasingly providing new possibilities for collaborative learning [12]. For example, social software such as Blogs, Wikis, or other collaboration systems, has the unique effect of spurring online interaction, which is the foundation for cognitive development, teaching, and social presence [13]. More importantly, research studies [14] have reported positive learning outcomes of collaborative Internet projects: increased student motivation and understanding of learning as students learn in groups through the use of ICT.

### *1.3 Research gap*

The affordances of ICT to facilitate SDL and CoL have been well-documented in the past decade. However, teachers' use of ICT for these two strategic foci in Singapore schools appears less informed. In this paper, we report the teachers' perceptions of their use of ICT for SDL and CoL in Singapore schools.

## **2. Methods**

The study adopts a mixed-method design by including survey data (quantitative) and FGDs with teachers and classroom observations (qualitative). This paper reports the survey results on teachers' perceptions on the use of ICT for SDL and CoL as well as the key findings from the FGDs and leaders interviews. The survey was administered online while the semi-structured FGDs and interviews were conducted face-to-face with teachers and school leaders. Each FGD or interview session lasted 40 to 60 minutes and was audio-recorded. Transcripts of the recorded audios were analysed. Sample items of survey and FGD/interview questions are provided in the appendixes.

### 3. Participants

The survey was administered in 50 primary and 50 secondary schools. Random sampling was employed in the first year and the same schools were studied over the 5 years. A total of 1684 primary and 1899 secondary teachers participated in the online survey in 2009. The 2010 and 2011 survey respondents included respectively: 1654 primary and 1899 secondary teachers; 2049 primary and 2121 secondary teachers. The FGDs were conducted in 6 Primary and 6 Secondary schools. Sampling was purposive: based on their level of ICT use for SDL and CoL drawn from the 2009 baseline survey results. In each school, one FGD with 6 to 8 teacher participants was conducted.

### 4. Findings and Discussion

#### 4.1 Survey findings

A mid-point of 3.50 was chosen based on a likert scale of 1 to 6, with 1 as “not at all” and 6 as “all the time”. Results on teachers’ engagement in promoting SDL and CoL among students were generally positive. The overall mean responses from 2009 to 2011 were 4.26 for engagement in SDL and 4.28 for engagement in CoL, both above the mid-point over the 3 years. However, the overall mean responses for use of ICT for SDL (SDLT) were below the mid-point over the 3 years (M=3.09 for the three years). The results indicated a less desirable use of ICT from teachers in promoting SDL among students. Similarly, the overall mean response for use of ICT for CoL from 2009 to 2011 is 3.43, slightly below the mid-point, which indicated a less desirable use of ICT among teachers for fostering CoL in the class.

#### 4.2 FGDs findings

Data collection for current year is ongoing hence we present findings from year 2009 and 2010. The FGDs revealed 3 key obstacles that teachers faced in using ICT for promoting SDL and CoL among students. These problems were common to both primary and secondary school teachers. First, teachers interviewed felt that time constraint was a key obstacle for them to infuse ICT into their lessons. They elaborated that these constraints were imposed by a need to rush for the syllabus; lack of time to explore ICT resources and technical problems associated with computer use.

Time is actually the factor that... influences the use of ICT during my lessons. Because we still need to rush for the syllabus... so... not every single lesson is actually possible to infuse the ICT tool... (Secondary school teacher)

MOE (Ministry of Education) do give us resources like edumall, and also the sharing portal within the cluster and in the cluster. I think that is a very good platform for us to actually look for resources. But one thing we don't have is... the time to go and search for resources which is like thousands... of them (Primary school teacher)

Next, the teachers interviewed reported mindset problems. Some believed that they “might not see the full potential for IT” because they are “not... IT-savvy” or “not familiar with the software”. Others felt that the use of ICT may not “adds value” or “enhances the lesson” and

these teachers are less motivated to “go through the trouble to try to do it”. Instead, they preferred to stick to the pen and paper.

The reason why I use ICT is to... enhance the learning. But if pen and paper can do a better job then I might as well use pen and paper... (Secondary school teacher)

The third obstacle teachers faced was related to the students’ ability in using ICT for SDL and CoL. Teachers were cognizant of irresponsible students and they felt that lessons using ICT for SDL or CoL were less effective to engage them.

Students can just go to internet and copy a whole chunk of thing and they can say that they have researched and they have found the answer. But we question them we realize that they don’t know anything. (primary school teacher)

When teachers bring [students] to the class then they would prefer to go to internet to surf and go to sites that excite them rather than follow the lesson... (Secondary school teacher)

#### *4.3 Interviews findings*

Findings from the school leaders corroborated with that reported from the teachers. The leaders also reported obstacles to mp3 implementation associated with teachers’ mindset and time constraints imposed by syllabus coverage.

Some people might feel that, chalk and talk, the old traditional method will get it done. So why should I bother. So mindset change is an issue for some. (Primary school principal)

In addition, the leaders felt that teachers could enhance their capacity to use ICT for pedagogical purposes. Most leaders reported that their teachers were competent in the use of ICT tools but they have yet to integrate ICT into pedagogy effectively. One primary school principal described, “sometimes the technology does not really adds value to the lesson” and “the focus is on the technology rather than the pedagogy”. Another key concern among the leaders was related to the understanding of SDL and CoL. The leader generally agreed that the understanding of these concepts need to be enhanced and regulated among teachers.

mp3 is calling for self directed, a very high level. But if your HODs, the level heads and all do not know, then how will it carry out. I think the training that has to be provided... probably more of a collaboration with them implementing it in the school (Primary school principal)

You have got to figure out what it means first, perhaps take away the ICT and understand what CoL is in terms of the pedagogy itself, the understanding of what the students are supposed to develop at the end. And after we can figure out and are quite consistent in our understanding of what the idea is, then we ask what does SDL and CoL look like when we have IT in use in the lessons, so that we have a common understanding of what these phrases mean and in the classroom in terms of lesson design, that has to be sorted out. (Secondary school principal)

The findings from the FGDs and interviews suggested that there is a considerable level of challenge for both primary and secondary school teachers in using ICT to promote SDL and CoL among students. To help teachers in moving forward with the reform goals, school

leaders could consider more support structures for ICT integration. For example, infusing some form of curriculum space for teachers to plan ICT-based lessons and creating more professional development opportunities for teachers to enhance their ICT and pedagogical competencies. As a suggested way forward, schools might adopt teacher professional learning communities (PLC) [15] to co-construct curriculum-based use of ICT for SDL and CoL. Through PLC, leaders and teachers could collaborate to set the directions for the school to bring about positive student outcomes related to mp3. Moreover, PLCs within schools enable teachers from the same level and teaching the same subjects to regularly share best practices and learn from one another. Such continuous professional dialogue and feedback could help teachers enhance their understanding of ICT tools and pedagogy and hone their own classroom practice for using ICT for 21<sup>st</sup> century learning.

## 5. Conclusion

The implementation of mp3 aims to bring about 21<sup>st</sup> century learning through the use of ICT in Singapore schools. Specifically, schools are called to integrate the use of ICT for SDL and CoL among students. From this study, we concluded that the integration of ICT into lessons for developing students' SDL and CoL competencies among teachers is less pervasive. Teachers are still caught up with problems related to time constraints and mindset issues. These findings were corroborated with those from the leader interviews. It is perhaps useful for schools to adopt more implementation strategies. Schools for example are encouraged to form teacher PLCs to co-construct curriculum-based use of ICT for the two strategic foci. This is hoped to promote better awareness and understanding on the use of ICT for SDL and CoL among teachers and help them to hone and align teaching practices toward the reform directions.

## References

- [1] Wong, E.M.L., & Li, S.C. (2006). Is ICT a Lever for Educational Change? A Study of the Impact of ICT Implementation on Teaching and Learning in Hong Kong, *Informatics in Education*, 5(2), 317–336
- [2] MOE. (2008, 4 Aug 2008). Ministry of Education. Retrieved 02 Jun, 2009, from <http://moeuxwp03.moe.gov.sg/edumall/mp3/mp3.htm>
- [3] Knowles, M. S. (1975). *Self-directed learning : a guide for learners and teachers*. New York.
- [4] Candy, P. C. (1991). *Self-direction for lifelong learning : a comprehensive guide to theory and practice*. San Francisco: Jossey-Bass.
- [5] Garrison, D. R. (1997). Self-Directed Learning: Toward a Comprehensive Model. *Adult Education Quarterly*, 48(1), 18-33.
- [6] Lumsden, L. S. (1999). *Student motivation : cultivating a love of learning*. Eugene, OR: ERIC Clearinghouse on Educational Management.
- [7] Vonderwell, S., & Turner, S. (2005). Active learning and preservice teachers' experiences in an online course: a case study. *Journal of Technology and Teacher Education*, 13(1), 65(20).
- [8] Song, L., & Hill, J. R. (2007). A Conceptual Model for Understanding Self-Directed Learning in Online Environments. *Journal of Interactive Online Learning*, 6(1 (Spring)), 44-55.
- [9] Chai, C. S. & Tan, S. C. (2010). Collaborative learning and ICT. In Chai, C. S. & Wang, Q. (Eds.), *ICT for self-directed and collaborative learning* (pp. 52-69). Singapore: Pearson.
- [10] Gerlach, J. M. (1994). Is This Collaboration? *New Directions for Teaching and Learning*, Fall(59), 5-14.
- [11] Dillenbourg, P. (1999). What do you mean by “collaborative learning”? In P. Dillenbourg (Ed.), *Collaborative learning: Cognitive and conceptual approaches* (pp.1-16). Amsterdam: Elsevier.
- [12] Littleton, K., & Light, P. (1999). *Learning with computers : analysing productive interaction*. London; New York: Routledge.
- [13] Wang, M. (2007). Designing online courses that effectively engage learners from diverse cultural backgrounds. *British Journal of Educational Technology*, 38(2), 294-311.
- [14] Lonergan, D. (1997). Network science: Bats, birds and trees. *Educational Leadership*, 55(3), 34.
- [15] DuFour, R. (2004). Schools as learning communities. *Educational Leadership*, 61(8), p6-11.

## Appendix 1

Sample items of online survey questions for the teachers' use of ICT to promote SDL and CoL among students

	Sample items
SDL	I get my students to use ICT as part of their schoolwork in the following ways: a. Share their thoughts and ideas about their schoolwork (e.g. through multimedia storytelling, voice-recording, blogs) b. Find out more information on the Internet on their own to understand their lessons better
CoL	I get my students to use ICT as part of their schoolwork in the following ways: a. Work with their group members to complete a project b. Share their thoughts with their group members on how they can work better together.

## Appendix 2

Sample questions for FGDs and Interviews

### Teachers

1. Can you describe the most recent ICT-integrated lessons that you have conducted in class?
2. How do you promote or encourage self-directed learning in your lessons?
3. How do you promote or encourage collaborative learning in your lessons?
4. Can you describe some factors that influence your use of ICT to facilitate teaching and learning at a class level?

### School leaders

1. Can you describe some plans/goals for the use of ICT in your school currently?
2. What are the directions you give to your staff concerning the use ICT for teaching and learning?
3. What are the processes in place to promote ICT integration and use among staff?
4. What are some key problems that you have encountered in promoting and implementing ICT use? How did you overcome the problems?