<table>
<thead>
<tr>
<th>Title</th>
<th>Teachers’ perceptions of engaging students in self-directed learning and collaborative learning in Singapore classrooms</th>
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<tr>
<td>Author(s)</td>
<td>Doris Choy, Seng Chee Tan and Kok Cheng Ang</td>
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</table>

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**Paper Title**  Teachers' Perceptions of Engaging Students in Self-Directed Learning and Collaborative Learning in Singapore Classrooms

**Author(s)**  Doris Choy, National Institute of Education - Nanyang Technological University; Seng Chee Tan, National Institute of Education - Nanyang Technological University; Kok Cheng Ang, Ministry of Education, Singapore

**Session Title**  Technology as an Agent of Change in Teaching and Learning SIG Roundtable 5: Technology as an Agent of Change in Education

**Session Type**  Roundtable Presentation

**Presentation Date**  4/19/2015

**Presentation Location**  Chicago, Illinois

**Descriptors**  Cooperative Learning, Self-directed Learning, Technology

**Methodology**  Mixed Method

**Unit**  SIG-Technology as an Agent of Change in Teaching and Learning

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Teachers’ Perceptions Of Engaging Students In Self-directed Learning and Collaborative Learning In Singapore Classrooms

Abstract

The purpose of the paper is to investigate the development of teachers’ perceptions towards engaging students in self-directed learning (SDL) and collaborative learning (CoL) activities, and with the support of information and communication technology (ICT) in classrooms. More than 4000 teachers’ perceptions towards engaging students in SDL and CoL activities were collected through an online survey from 2010 to 2013. The findings showed an upward trend in their perceptions in SDL, SDL with ICT and CoL with ICT. Further analysis of the 2013 data showed that there were some significant differences across different levels (i.e.: primary, secondary, and junior college levels). These findings suggest professional development areas that could further support teachers in integrating SDL and CoL activities in class.

(120 words)

Background

Self-directed learning (SDL) and collaborative learning (CoL) have been widely researched with renewed interests as they were included as key concepts, outcomes, or pedagogical approaches in various 21st Century skills frameworks. The ISTE standards for Students expected students to be able to “interact, collaborate, and publish with peers or experts” and “plan and manage activities to develop a solution” (ISTE, 2014). In Singapore, Ministry of Education developed the 21st Century Competencies, where SDL and CoL are the desired outcomes for students (Ministry of Education, 2014).

Studies have shown that integrating SDL and CoL activities into learning can improve students’ academic performance and increase their overall satisfaction in learning. SDL and CoL were identified as key pedagogical approaches to develop students’ critical thinking skills, 21st century skills and to prepare students as life-long learners. Gibbons (2002) defined self-directed learning as learners initiating challenging activities and developing personal knowledge and skills to pursue the challenges successfully. More specifically, Knowles (1975) describes SDL as a process in which individuals take the initiative in diagnosing their learning needs; formulating their learning goals; identifying resources for learning; choosing and implementing appropriate learning strategies; and evaluating their learning outcomes.

Collaborative learning (CoL) is a process where a group of students work towards achieving shared learning goals. There is positive inter-dependence among students in a group and students display individual and group accountability (Johnson & Johnson, 2006). It requires students to co-construct understanding, to negotiate meaning, to assess soundness of ideas based on appropriate evidence, and to resolve conflicting views (Scardamalia, 2002, Dillenbourg, 1999; Johnson & Johnson, 2006).

In addition, the integration of Information and Communication Technology (ICT) to learning was suggested by many researchers as essential pedagogical means for cultivating independent, autonomous, as well as collaborative learning in classrooms (Collins & Halverson, 2010; Howland, Jonassen & Marra, 2012). The successful integration of ICT has brought forth affordances such as allowing learners to develop self-directed learning skills through accessing a large amount of online resources and develop collaborative learning skills through creating community of learners, and co-constructing knowledge with relative ease.
The purpose of the paper is to investigate the development of teachers’ perceptions towards engaging students in self-directed learning (SDL) and collaborative learning (CoL) activities with and without the integration of information and communication technology (ICT) in Singapore classrooms. The main research questions are:

1. What are the teachers’ perceptions of engaging students in SDL and CoL with and without ICT in their class from 2010 to 2013?
2. Are there any significant changes in their perceptions?
3. Looking at that the data from 2013, are there any significant differences when comparing between the perceptions of primary, secondary, and junior colleges teachers?

Design and Data collection procedure

The results presented in this paper are part of a larger study that assesses the implementation of the Third ICT Masterplan (mp3) and its corresponding impact on Singapore schools from 2010 to 2013. Some of the main mp3 goals are: (1) Students possess competencies for self-directed and collaborative learning through the effective use of ICT as well as become discerning and responsible ICT users; and (2) Teachers have the capacity to plan and deliver ICT-enriched learning experiences for students to become self-directed and collaborative learners as well as nurturing students (Ministry of Education, 2008).

Survey questions were presented as 6-point Likert scales consisted of about 80 items. From 2010 – 2013, 110 schools were selected through stratified random sampling (50 primary schools (grades 1-6), 50 secondary schools (grades 7 – 10), and 10 junior colleges (grades 11 – 12). Teachers from these schools were invited to complete the online survey voluntarily. Each year, more than 4000 teachers completed the online survey (see Table 1). For the purpose of this paper, we focused on the teachers’ responses to the questions related to their perceptions towards the use of: (1) SDL, (2) SDL with ICT, (3) CoL, and (4) CoL with ICT. A total of 30 items from the survey instrument were relevant to the research questions, they will be discussed in this paper. In 2014, more than 100 teachers were invited to participate in 15 focus group discussion sessions to verify some of the major findings from the study. Parts of their responses will be discussed in this paper to address the research questions.

Table 1. Demographic information of the participants from 2010 – 2013.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of participants</th>
<th>Male (%) vs. Female teachers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>4112</td>
<td>1284 (31.5%) vs. 3325 (68.5%)</td>
</tr>
<tr>
<td>2011</td>
<td>4835</td>
<td>1510 (31.2%) vs. 3325 (68.8%)</td>
</tr>
<tr>
<td>2012</td>
<td>4156</td>
<td>1341 (32.3%) vs. 2815 (67.7%)</td>
</tr>
<tr>
<td>2013</td>
<td>4671</td>
<td>1458 (31.2%) vs. 3213 (68.8%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary (%)</td>
<td>1654 (40.3%) /</td>
<td>2049 (42.4%) /</td>
<td>1579 (38.0%) /</td>
<td>1931 (41.3%) /</td>
</tr>
<tr>
<td>Secondary (%)</td>
<td>1819 (44.2%) /</td>
<td>2121 (43.9%) /</td>
<td>1859 (44.7%) /</td>
<td>2023 (43.3%) /</td>
</tr>
<tr>
<td>Junior college</td>
<td>639 (15.5%)</td>
<td>665 (13.7%)</td>
<td>718 (17.3%)</td>
<td>717 (15.4%)</td>
</tr>
</tbody>
</table>
Data Analysis and Results

Due to the quantitative nature of the data collected for this study, inferential statistical methods were used to analyse and report on the data. The analysis and results were presented according to teachers' perceptions of engaging students in SDL and CoL activities, and with the support of ICT in their classroom.

Teachers’ perceptions of engaging students in SDL in their class

Overall, the teachers’ perceptions of engaging students in SDL activity were positive. The means of their perceptions were: 4.23 in 2010 and in 2011, 4.29 in 2012 and 4.23 in 2013 over a 6-point scale. The trend analysis showed that there were significant differences in teachers’ perceptions of the use of SDL (F(3,17770)=7.154, p<.001) from 2010 to 2013. The follow-up analysis showed that teachers’ perceptions of the use of SDL in 2012 (M=4.29) was significantly higher when compared with 2010 and 2011 (M=4.23) (p<.001) (See Table 2).

Table 2. Overall means of the teachers’ perceptions from 2010 – 2013.

<table>
<thead>
<tr>
<th>Year</th>
<th>SDL</th>
<th>SDL with ICT</th>
<th>CoL</th>
<th>CoL with ICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>4.23</td>
<td>3.06</td>
<td>4.27</td>
<td>3.49</td>
</tr>
<tr>
<td>2011</td>
<td>4.23</td>
<td>2.99</td>
<td>4.28</td>
<td>3.29</td>
</tr>
<tr>
<td>2012</td>
<td>4.29</td>
<td>3.10</td>
<td>4.29</td>
<td>3.42</td>
</tr>
<tr>
<td>2013</td>
<td>4.23</td>
<td>3.05</td>
<td>4.27</td>
<td>3.35</td>
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(***p-value < .01)

Further investigation of the 2013 data showed that there are significant differences in the perceptions of primary, secondary and junior college teachers in using SDL (F(2,4668)=10.462, p<.05). Teachers from junior colleges (M=4.37) perceived that their engagement of students in SDL in class were significantly higher than primary (M=4.26) and secondary (M=4.23) school teachers (p<.001). This pattern was consistent throughout the four-year study.

Teachers’ perceptions of engaging students in SDL with ICT in their class

Teachers’ perceptions in their students’ engagement of SDL with ICT in class were significantly lower than SDL without ICT. The means of their perceptions were: 3.06 in 2010, 2.99 in 2011, 3.10 in 2012 and 3.05 in 2013. The trend analysis showed that there were significant differences in the perceptions of teachers engaging students in SDL using ICT from 2010 to 2013 (F(3,17770)=9.350, p<.001). The follow-up analysis showed that perceptions of teachers engaging students in SDL using ICT were significantly higher in 2010 (M=3.06) and 2012 (M=3.10) compared with 2011 (M=2.99, S.D.=1.026) (p<.001) (see Table 2). There was no significant difference between 2012 and 2013.

The 2013 data showed that the perceptions of teachers engaging students in SDL using ICT were significantly different across levels (F(2,4668)=3.794, p<.05). The means for teachers were: 3.01 at primary, 3.10 at secondary, and 3.05 at junior college levels. The perceptions of secondary teachers (M=3.10) was significantly higher than primary teachers (M=3.01) (p<.001).
Teachers’ perceptions of engaging students in CoL in their class

The teachers’ perceptions of engaging students in CoL in class were positive. However, there was no significant difference in the perceptions from 2010 to 2013. The means were: 4.27 in 2010, 4.28 in 2011, 4.29 in 2012 and 4.27 in 2013.

From the mean scores in 2013, perceptions of teachers engaging students in CoL in class were fairly positive (M=4.27). There were significant differences when we compared their perceptions across levels (F(2, 4668)=69.485, p<.001). The results showed that primary teachers (M=4.44) perceived that they were engaging students in CoL significantly more than secondary (M=4.17) and junior college (M=4.07) teachers (p<.001). The perceptions of the secondary teachers were also significantly higher than junior college teachers (p<.001). This pattern is consistent from 2010 to 2013, where primary teachers showed more positive perceptions towards the use of CoL in class when compared to secondary and junior college teachers.

Teachers’ perceptions of engaging students in CoL with ICT in their class

The overall teachers’ perceptions of engaging students in CoL with ICT were significantly lower than using CoL without ICT. The means of using CoL with ICT were: 3.49 in 2010, 3.29 in 2011, 3.42 in 2012, and 3.35 in 2013. The comparisons of means showed that there were significant differences in the perceptions of teachers from 2010 to 2013 (F(3, 17770)=13.308, p<.001). The follow-up analysis showed that the teachers’ perceptions were significantly higher in 2010 (M=3.45) and 2012 (M=3.42) compared with 2011 (M=3.29) (p<.001) (See Table 2).

The 2013 data showed that the perceptions of teachers engaging students in CoL using ICT were significantly different across levels (F(2, 4668)=42.298, p<.001). The means for teachers’ perceptions in engaging students in CoL using ICT in different levels were: Primary (M=3.14); Secondary (M=3.51); and junior colleges (M=3.47). When comparing across levels, statistical analyses showed that the perceptions of teachers engaging students in CoL using ICT for secondary and junior colleges teachers were significantly higher than primary teachers.

Discussions and Conclusion

The survey results showed that there was an upward trend on teachers engaging students in SDL, SDL using ICT and CoL using ICT from 2010 to 2012, but there was no significant variation from 2012 to 2013. The perceptions of teachers engaging students in SDL and SDL with ICT were significantly higher in 2012 than in 2010 and 2011. Their perceptions in engaging students in CoL with ICT were significantly higher in 2012 when compared with 2011. When compared between with or without the integration of ICT, teachers perceived they engaged students in SDL and CoL activities significantly more than SDL and CoL with ICT in class. Teachers also perceived that they were conducting more CoL with ICT activities than SDL with ICT activities in class.

During the focus group discussions in 2014, we invited over 100 teachers and aimed to verify some of the main findings from this study. Primary teachers shared that they were concerned with implementing SDL and CoL with ICT as they had perceived that they need to focus on teaching their students the technical skills before conducting such activities. This could possibly explain why teachers’ engagement of
students in SDL and CoL with ICT were higher for the secondary and junior college levels compared to
the primary level.

Teachers agreed with the finding that they engaged students with CoL using ICT more frequently than
SDL using ICT. Primary teachers felt that students from Grades 1 – 3 may not be ready for SDL with or
without ICT. They also felt that primary school students show more confidence when they are able to
work in groups. Secondary and junior college teachers perceived that it is challenging to monitor and
assess students’ SDL outcomes. Some secondary and junior college teachers shared that they designed
SDL related activities for students as precursor to support CoL activities in class.

The results from this study showed that the perceptions of Singapore teachers in engaging students in
SDL, SDL with ICT, CoL, and CoL with ICT were fairly positive. Moving forward, professional
development (PD) for teachers could focus on strengthening other aspects of SDL and CoL. For SDL, PD
on supporting students’ metacognition, monitoring students’ learning process and supporting students’
self-regulation could be provided. For CoL, PD on helping teachers to design activities that encourage
social process that facilitate collaborative knowledge construction and knowledge building could be
provided. Additional information related to the development of the perceptions of the teachers and
representative quotes will be presented during the presentation at the Annual Conference.

(1980 words)

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