A Case Study of Online-based Collaborative Lesson Planning

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Abstract—Lesson planning is an important activity in teachers’ workplace learning. Collaborative lesson planning based on network can expand the width and depth of the lesson planning process. So online-based collaborative lesson planning becomes more and more important and attract more attention. The research focuses on the problem how to conduct well-structured online-based collaborative lesson planning and what features contained in the knowledge creation dimension of online-based collaborative lesson planning activity. From the case study of this research, researchers came up with two results. Firstly, Through collaborative lesson planning, teachers can clearly illustrate their learning results and get some practical knowledge. And for the online-based collaborative lesson planning behavior, teachers mainly illustrated their opinions and suggestions. Secondly, leaders and members who did not actively participate in the activity can both affect the quality of collaborative knowledge creation. If members participate better in the dimension of Q&A and Motive in online-based collaborative lesson planning, the group will be more likely to get a better knowledge creation.

Index Terms—Online-based Collaborative Lesson Planning; Professional Learning Community; Case Study.

I. INTRODUCTION

Teaching today is increasingly complex work, and requires the highest standards of professional practice to perform it well(Hargreaves and Goodson,1996). Teachers are the midwives of that knowledge society. Only teachers can transform education from inside the classroom itself(DuFour R, DuFour R, & Erkens C, et al, 2009). For inservice teachers as teaching practitioners, they are faced with many pressures to implement instructional reform and accountability measures, and urgently require new knowledge and skills. It is a critical issue for teachers to update domain knowledge and expand teaching skills in order to continue to work effectively with students’ learning.

Teacher learning is considered an ongoing work-related process that leads to a change of cognition and/or behavior(Zwart R C, Wubbels T, Bolhuis S, et al., 2008). One method that contributes towards that goal is teacher collaboration learning. Collaborative learning to be effective in many kinds of settings and contexts(Grossman et al., 2001; Sawyer, 2006, 2013). Teacher learning occurred within different collaborative settings in schools, however, with different degrees of intensity and outcomes across these various settings(Doppenberg, 2012). There is evidence that when teachers collectively work on problems of practice, they will be likely to better meet the needs of all students(Darling-Hammond, 2010). Lesson study(LS) which is a collaboration-based teacher learning approach attracted the international attention. The typical lesson study is an iterate process which includes setting goals for students’ learning and development, planning a “research lesson”, observing the research lesson and collecting data on students’ learning and development, and using the data to reflect on the lesson and instruction more broadly (Murata, 2011). Well-developed teacher collaborative learning can positively improve teachers’ teaching practices, students’ learning activities (Vescio, V., Ross, D., & Adams, A, 2008), and students’ achievements (Chichibu T, Kihara T, 2013).

Collaboration and teamwork must begin in the planning process(Wenger, Hornyak, 1999). However, few researches focus on the problem what factors will affect teachers’ online-based collaborative lesson planning(CL) behaviors. So the study explores teachers’ behaviors in online-based CL and the factors which could affect teachers’ behaviors. The paper is organized in five sections: introduction, relevant research, methodology, data and analysis, discussion, and conclusion.

II. RELAVANT RESEARCH

A. The Constraints of Traditional Lesson Study

Lesson study is a way to facilitate teacher professional learning in school context. Nowadays lesson study has a variety of environment, such as in small-level school-scale collaboration, mid-level district-scale collaboration, and large-scale national-level collaboration. Different types of professional learning community can meet different demands and different teachers’ interests. The school-level variables of professional learning communities include faculty trust in colleagues, collective teacher efficacy, and affect teachers’ commitment to students(Lee J C, Zhang Z, Yin H, 2011). For large-scale and national-level collaboration, it often travels long distances to participate, and hundreds of people can gather for one event. For mid-scale, district-level lesson study, teachers may come together for a district’s professional development day where they have a menu of choices of lessons with different grade levels, subject areas, and topics to attend. Different school can focus more on particular aspects of teaching mathematics or content issues than that of in-school LS(Murata and Takahashi, 2002). The district-level LSs play an important role in improving curricula, textbooks, and teaching and learning materials in Japan(Chichibu T, Kihara T, 2013). However, barriers of the implementation include lacking of shared meeting time and a shortage of teachers who share the same subject areas or common goals and
interests. Though convening teachers from multiple districts can alleviate this problem, however teachers are reluctant to travel for meetings due to the restrictions of time and cost (McConnell T J, Parker J M, Eberhardt J, et al, 2013).

B. The Advantage of Online-based Collaborative Lesson Planning (CLP)

Collaborative lesson planning refers to the joint efforts of teachers in planning for their lessons in scheduled meetings (Andy Newell, 2012). Der Valk T A E V and Broekman H (1999) proposed three main aspects of this setting in the lesson preparation method, that is the choosing of the concept to be dealt with in the prepared lesson; the details of the lesson’s preparation task; and the subsequent interview. CLP not only involves the individual knowledge construction, but also involves the co-construction. It is a kind of peer coaching process. Through CLP, it can reduce teacher isolation (Jalongo, M. R., Rieg, S. A., & Helterbran, V. R, 2007). It can help teachers focus on practical teaching and learning problems, and provide interactive and developmental contexts for teachers to engage in professional dialogues. Meanwhile, it can offer a platform for curriculum development where new curriculum arrangements, innovative teaching strategies and assessment methods can be put to trials. Although it is very time consuming at the beginning, they become more experienced and the coordination language more precise, time spent is significantly reduced (Wenger M S & Hornyak M J, 1999). Moreover, collaboration can help overcome obstacles such as a lack of skill in research methods (process validity), strengthen the relationship between researchers and teachers, and promote knowledge creation (Bruce C D, Flynn T & Stagg-Peterson S, 2011). However, different peer coaching structures and activities have different behaviors and effects for collaborative lesson planning (Zwart R C, Wubbels T, Bolhuis S, et al, 2008).

The online community of practice (CoP) has become an important platform in which individuals with similar interests or common goals get together to share resources, develop working strategies, solve problems, and improve individuals well as organizational performance (Tseng, F. C., & Kuo, F. Y, 2014). However online CoP can not become an automatic platform, every lesson plan is a learning cell. One learning cell can include content, resource and activity. Different people can collaborative editing, annotate and comment for the content in one learning cell. The detail is shown in Fig. 1. The platform can record the evolutional process for the content in one learning cell. The detail is shown in Table 1.

C. Research Questions

This case study was designed to explore the influential factors of collaborative knowledge creation in the online-based collaborative lesson planning. It hoped to promote further collaborative lesson planning and make better quality knowledge creation. So the study proposed two research questions:

Question 1: What are the characteristics of teachers’ CLP behavior under the condition of online-based CLP?

Question 2: What factors can affect teachers’ CLP behavior?

III. METHODOLOGY

A. Participants

There are eighteen teachers teaching English in primary schools participating in collaborative lesson planning for half a day. They are randomly assigned to eight groups and talking about how to improve English classroom teaching. Before the CLP, all of the teachers were required to provide an original lesson plan which can mirror real teaching level. The detailed are shown in Table 1.

B. Methods

Each group would choose a target lesson plan according to their willings and group members should collaboratively prepare it. The content of group A is My Family lesson provided by A1, and the content of group B is Good Manners lesson provided by B1, and the content of group C is What Can You See lesson provided by C1.

The process of CLP activity includes four phases. Firstly, Everyone reads the target lesson plan and in-depth exchanges the personal ideas in the online platform. Secondly, Each group negotiates with each other by face to face and reaches a group consensus for the lesson planning sample. Thirdly, each group reflects learning achievement and shares in the online platform.

C. The Online-based CLP Platform

The CLP platform is named after learning cell. In this platform, every lesson plan is a learning cell. One learning cell can include content, resource and activity. Different people can collaborative editing, annotate and comment for the content in one learning cell. The detail is shown in Fig. 1. The platform can record the evolutional process for one learning cell. Some learning cells can be automatically and manually aggregated into knowledge group according to the semantic analysis. In this study, tutors constructed one knowledge group for every teacher to submit their original lesson plan. In the discussion of the knowledge group, each group can share their group consensus and gain.
The ability of lesson planning was assessed by the learning design assessment criterion which includes five relatively independent dimensions, that is integrity, feasibility, hierarchy, context, and communication. There are two teacher educators assessing teachers’ works, the kappa of five dimensions are 0.591, 0.612, 0.519, 0.727, 0.667 respectively. After it, the ability to design lesson plan was transformed to different ranking according to the work scores, the forum is Sum=2*NA+1*NB+0*NC. If Sum <=3, it means the ability is low level. And if 3<Sum<7, the ability is medium level. If 10>=Sum>7, it means the ability is high level.

(2) CLP Behavior Coding

The study uses content analysis to record the CLP behavior. According to Adrianson’s coding in communicative processes, the main categories of CLP behaviors include information, agreement/disagreement, opinion, suggestion, summary of suggestions, Q&A, motive (see Table 2). Meanwhile, we identify meaningful utterances of the group consensus as the minimal units of data analysis. The indicators are based on Hsiu-Ting Hunga and Hui-Chin Yeh (2013) criteria (see Table 3).

Table 2 THE INDICATORS OF CLP BEHAVIOR ADJUSTED FROM ADRIANSON (2001)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>To make a point or to clarify a statement in the discussion; “It says means that….”</td>
</tr>
<tr>
<td>Agreement/Disagreement</td>
<td>To express agreement or disagreement with another.</td>
</tr>
<tr>
<td>Opinion</td>
<td>To give a participant’s personal view of something; that is, an interpretation or inference from something in the written text, “I think that….”</td>
</tr>
<tr>
<td>Suggestion</td>
<td>To raise a suggestion to solve a specific sub-problem</td>
</tr>
<tr>
<td>Summary of suggestions</td>
<td>To sum up the suggestions and try to find a solution to the problem</td>
</tr>
<tr>
<td>Q&amp;A</td>
<td>To ask questions or provide answers.</td>
</tr>
<tr>
<td>Motive</td>
<td>Every motive given in support of a suggestion; “The reason is that….”</td>
</tr>
</tbody>
</table>

Table 3 INDICATORS OF TEACHER CHANGE

<table>
<thead>
<tr>
<th>TC1</th>
<th>Statements regarding teachers’ own learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC2</td>
<td>Statements concerning observations or evaluations of student learning outcomes</td>
</tr>
<tr>
<td>TC3</td>
<td>Statements indicating a wish to carry out certain behaviors</td>
</tr>
<tr>
<td>TC4</td>
<td>Statements based on comparison and contrast of events or perceptions</td>
</tr>
<tr>
<td>TC5</td>
<td>Use of verbs that incorporate change in teacher reports of events, such as: change, to modify, to gain, and so on</td>
</tr>
<tr>
<td>TC6</td>
<td>Use of change signaling adverbs in teacher reports of events, such as: before, different, suddenly, and so on</td>
</tr>
</tbody>
</table>

IV. DATA AND ANALYSIS

A. Group Consensus

From the result of collaborative lesson planning, the level of three groups’ target lesson plans have been improved. However, group B and group C had more transformed. Though group A had improved to some degree, the lesson plan still remained in medium level. The study uses content analysis to record the CLP behavior. According to Adrianson’s coding in communicative processes, the main categories of CLP behaviors include information, agreement/disagreement, opinion, suggestion, summary of suggestions, Q&A, motive (see Table 2). Meanwhile, we identify meaningful utterances of the group consensus as the minimal units of data analysis. The indicators are based on Hsiu-Ting Hunga and Hui-Chin Yeh (2013) criteria (see Table 3).
trends. TC1 (statements regarding teachers’ own learning outcomes), TC4 (statements based on comparison and contrast of events or perceptions), and TC3 (statements indicating a wish to carry out certain behaviors) have achieved greatest improvement, the rates are 86.36%, 9.10% and 4.55%. The detailed data is shown in Table 4. However, different groups varies in the number of agreements achieved. Group B achieved the greatest 12 items, followed by group A and group C.

### Table 4. TEACHER CHANGE

<table>
<thead>
<tr>
<th>Origina l level</th>
<th>Termin al level</th>
<th>T 1</th>
<th>T 2</th>
<th>T 3</th>
<th>T 4</th>
<th>T 5</th>
<th>T 6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>10</td>
<td>10</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>19</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>22</td>
</tr>
</tbody>
</table>

### B. The CLP Behaviors

From the CLP behavior of each group, teachers’ behavior mainly focus on suggestions and opinion. The detailed data is shown in Fig. 2. As ANOVA was used to analyze the CLP behaviors, it finds two phenomena. First in the aspect of Q&A, there is significant difference between group A and group B, the p-value is 0.001. Group B and group C also have significant difference, the p-value is 0.002. It means that group B performs better than group A and group C in Q&A. So the study mirrors that the Q&A interaction is the key factor. Secondly, in the aspect of motive, group A and group C are different, the p-value is 0.04. And group B and group C are significant difference, the p-value is 0.04. It means the motive of group C are significant worse than other groups. This reveals motive may be a very important factor that affect the improvement of CLP.

From the personal contribution viewpoints, A5 and A6 contributed the most and were adopted the most in group A. The detailed data is shown in Table 5. They were leading the CLP process. Though other members in group A also provided some viewpoints, none were adopted at last. In group B, B1 and B6 contributed the most, but the adopted viewpoints are lower than B2 and B3. B5 contributed the least. It is understandable because her lesson plan ability is not better than the target lesson plan. So she could not contribute more viewpoints in online platform. In group C, C2 and C4 contributed the most and they were very active in the activity. And their adopted numbers are the highest followed by C3, C6. None of the viewpoints by C5 are adopted. Thought the lesson plan ability of C5 were very high, she did not play a positive role in the group.

### Table 5. PERSONAL CONTRIBUTION

<table>
<thead>
<tr>
<th>Viewpoint number</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
<th>A6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>The adopted rate</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>75.00%</td>
<td>33.33%</td>
<td>40.00%</td>
<td>20.00%</td>
</tr>
<tr>
<td>Viewpoint number</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td>The adopted rate</td>
<td>50.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>50.00%</td>
<td>60.00%</td>
<td>68.18%</td>
<td>75.00%</td>
</tr>
<tr>
<td>Viewpoint number</td>
<td>5</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>17</td>
<td>42.86%</td>
</tr>
</tbody>
</table>

Knowledge without context has little effect for teacher learning. Collaborative lesson planning activity is a collaborative learning method conducted based on varying instructional contexts and it is also a process that practical knowledge interacts with each other. Through Preparing and discussing the lesson, teachers not only showed their existing PCK, but also promoted individual and group further development. However the different ways of interaction in practical knowledge may cause different outcomes.

To know the detailed features of CLP, It can be seen from the CLP influential factors. Firstly, the leader will inhibit the free communication. Because of leaders have strong subjective viewpoints indiscussion, the result of the CLP could highly rely on the leader’s personal ability while the other member do not contribute much to the result. So it is one of the most important reasons why group A did not achieve good-level plan through CLP. Secondly, Q&A and motivation could affect CLP’s efficiency. In Group B, The main reason group B achieved great improvements is that they fully performed Q&A and motive in CLP behaviors. In Q&A, high level group could be more likely to propose doubts when encountering problems, and doubts is an effective way to promote equal communication. So high level groups keep the equal and harmonious atmosphere with Q&A. However, in medium level group, even viewpoints proposed are almost subjective, the reason why should do this is not detailed presented. So the inability in motive is the main reason why medium level groups significant lower than other groups. But this problem is also a common problem in teachers’ collaborative lesson planning. Thirdly, positive emotion is a key factor in CLP. In CLP, group members should avoid participate passively as his/her negative emotion could affect the group’s CLP passively. So every teacher should actively participate in the discussion and communication. What’s more, according to the zone of proximal development (ZPD), every participant could achieve improvement through peer-communication no matter what levels your lesson plan are. In all, all members of the teacher group should be aware of the asymmetrical power relationship in the CoP of collective lesson planning.
VI. CONCLUSION AND LIMITATIONS

For in-service teachers, workplace learning is a good way for teachers transferring from knowledge to practical intelligence. Teachers can learn some strategies to solve teaching problems and puzzles through discussion and sharing. Different collaboration types can create different learning opportunities for participants. However, though a good environment for collaborative knowledge construction is created, we cannot ensure everyone to participate and learn from it. So in the online collaborative learning, environment and opportunities are equally important. Good environment can smoothly support the collaborative lesson planning.

Teachers can achieve much more under better learning environments and learning chances. Under this condition, they can produce higher quality CLP products. And through online collaborative learning, participants can participate in the CLP equally and independently. Moreover, they can present their viewpoints more freely. The case study gave some enlightenment. In traditional CLP, teachers are more likely to propose suggestions and opinions. However Q&A could have great effect on online-based CLP. So it is very important to make a change in this point. Meanwhile it is also necessary to pay attention to the motivation behind the opinions and suggestions.

The case study result can help conduct more effective online-based CLP. However, as the activity in this research is a blend CLP activity conducted in the same space with the help of CLP platform, it is different with the CLP which is absolutely conducted distantly. So the result could not applied to all kinds of CLP environment. At the same time, this research only analysed the knowledge creation data and did not deeply analyse the face-to-face lesson planning after the online-based CLP, there is shortage in the finding of the revolution of the achieved common knowledge of groups. But the researchers proposes that in online environment, the factors which could help promote individual knowledge creation are more important, so this study mainly focused on this point. And in further study, we will analyse the factors which could affect knowledge creation in CLP with the help of the data of online-based CLP and face-to-face CLP.

REFERENCES


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