

線上知識分享討論活動與其行為模式探究：

以教師/學生社群為例

摘要

侯惠澤

數位學習的教學環境中，教師的專業發展與教學均受到科技的影響，然而研究發現，由於教師間缺乏知識分享的組織文化，教學知識的互動受到限制，此外，運用網路的專題導向教學中，學生社群也存在著資料分析與互動不足的瓶頸。上述知識互動的侷限，均將可能影響教學與學習的深度，由於知識分享(Knowledge sharing)理論即聚焦於探討社群成員間知識的互動過程，為促進教師及學生社群的知識互動，本研究由三個子研究組成，分別以知識分享理論為基礎，將目前經常被討論運用於促進組織學習的問題解決(Problem-solving)、同儕評量(Peer-assessment)兩種互動學習策略與知識分享模式整合，針對教師社群及學習社群設計網路知識分享討論活動，並在研究方法上，同時採取質化與量化的各種研究法，包含序列分析、量化內容分析與文本分析等研究方法，藉由實徵、長期之觀察研究與行為模式分析，探究在運用各種知識分享策略時，各個子研究案例中社群成員在知識分享內容的知識建構深度與行為模式，以下為此研究三個案例分析之研究發現：

- (1) 運用同儕評量策略於學生社群，雖有一定程度之知識建構，然僅局限於某

些層面，在促進知識內化與外化上仍有相當程度的限制，且討論容易偏題，在序列分析上，偏題行為連續性高且達到顯著。

- (2) 運用問題解決策略於學生社群，無論在解題歷程的合理性與知識的建構的深度上，均有一定的正面影響，於知識的內化與外化有一定程度上的助益。經進一步檢驗高低成就學生行為的差異，與分析各編碼之間的關聯後發現，其中，高成就學生在提問或釐清問題的行為次數顯著較多，此外，大多數的解題行為編碼次數與知識建構編碼次數均達到顯著之正向關聯，表示解題行為與知識建構幅度有關，然而關聯分析也顯示，學生之學習成就與知識建構編碼次數並無顯著關聯。
- (3) 運用問題解決策略於教師社群，在知識建構之深度上有一定程度的正面影響，其解題的行為模式係符合理論基礎，於知識的內化與外化有一定程度上的助益，此外，教師在提出解答後會有一定程度的反問或釐清問題的行為特徵，惟較缺乏統整式之解答。
- (4) 在學生社群方面，運用問題解決策略的知識建構程度與專注性，均較其運用同儕評量策略為高。
- (5) 在運用問題解決策略方面，學生社群在知識建構程度上較教師社群為高。

由上述結果我們初步了解各策略輔助的面向與瓶頸，並於文中進而提出人為引導介入、策略設計與智慧型代理人科技未來可能的各種輔助建議。

此一系列案例研究可有助於探究數位學習環境下知識分享策略對教師或學生知識互動的影響與其實施的限制，其中包含互動學習與知識分享策略模式的整合與結合量化與質化內容分析以及行為序列分析方式之實徵行為 pattern 分析，對於數位學習下教師或學習社群知識分享策略的評估與發展期待能有重要參考價值。

Exploring Behavioral Patterns of and Effective Strategies for Online Knowledge Sharing Discussion: Cases of Teacher and Learner Communities

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Abstract

Under the instructional environment of e-Learning, teachers' professional development and instructional methods are both influenced by technology. Previous studies have shown that as for professional development, interactions related to instructional knowledge are limited because teachers lack the culture of "sharing teaching knowledge." Moreover, as for technology-assisted instruction, learner communities that utilize project-based learning also face the limitations of lacking sufficient data analysis and peer interactions.

The limitations in the above-mentioned knowledge interactions may influence the depth of teaching and learning. The research issues of knowledge sharing focuses on discussing the knowledge interactions between community members, we have conducted a series of pattern-discovering studies to deeply explore knowledge sharing discussions of teacher and learner communities. This study designed an online

knowledge sharing e-Learning environment for teachers and consisted of three sub-studies. Problem solving and peer assessment, the two strategies that are often utilized to facilitate group interactive learning, were integrated in the knowledge sharing fundamental models, and online knowledge sharing discussion activities that focus on teacher and learner communities were also designed to assist the internalization and externalization of knowledge. As for research methods for pattern exploring, we adopted lag sequential analysis, quantitative content analysis, and original protocol analysis. Through the empirical observations, we explored the depth and the behavioral patterns of the discussions, and this allowed us to explore and compare the actual status of different knowledge sharing discussion activities with different strategies, as well as the limitations in the applications. The following are the findings of the three case analyses in this study:

- (1) Although there is a certain degree of knowledge construction when applying peer assessment in the learner community, it is only limited to certain aspects, and knowledge internalization and externalization are still being limited. The discussions tend to deviate, and the sequential analysis shows that the deviations are continuous.
- (2) When applying problem solving strategies in the learner community, the

behavioral patterns have a positive effect on the rationality of problem solving and the depth of knowledge construction. When further examining the behavioral differences between high and low achieving students and the correlations between different codes, we can see that high-achieving students ask and clarify more questions. Moreover, the frequency of most of the coded problem solving behaviors and knowledge constructions show a positive correlation, indicating the problem solving behaviors and knowledge constructions have a positive correlation. However, correlation analysis also indicates that there is no significant correlation between students' learning achievement and the scale of knowledge constructions.

(3) When applying problem solving strategies in the teacher community, a certain degree of positive influence is seen on the depth of knowledge construction. The behavioral patterns of problem solving also have a positive effect on knowledge internalization and externalization. Moreover, teachers tend to answer a question with a question or clarify questions after asking them, and they often lack integrated answers.

(4) As for the learner community, the degree of knowledge construction and concentration using problem-solving strategy is higher than the counterpart using peer-assessment strategy.

(5) Regarding applying problem solving strategies, the learner community demonstrates a higher level of knowledge construction than the teacher community does.

Based on the above findings, we have gained an initial understanding of the aspects and bottlenecks of each knowledge-sharing strategy. In turn, we propose suggestions regarding guiders' intervention, strategy design, and intelligent agent development.

This series of studies helps us explore the influences and the limitations of these activities under the e-Learning environment. The study combines both theory integration and empirical observations, and we expect it will give contributions to the design, evaluation of online knowledge sharing activities/systems for teacher/learner communities in the context of e-Learning.

Dedicated to
My parents
and
My wife- Hui-Yu Hsiao

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TABLE OF CONTENTS

LIST OF TABLES.....	XV
LIST OF FIGURES.....	XVII
CHAPTER 1 Introduction.....	1
1.1 Statement of the Problem.....	1
1.2 Statement of Purposes.....	8
CHAPTER 2 Literature Review	12
2.1 Knowledge Sharing.....	12
2.2 Instructional Strategies of Online Collaborative Discussion.....	16
2.3 Problem Solving	19
2.4 Peer Assessment.....	21
2.5 Online Teacher Community.....	22
2.6 Online Project-based Learning.....	24
2.7 Analytical Methods for Online Discussions	26
CHAPTER 3 Knowledge Sharing Discussion Activity for Learner Community using a Peer-Assessment Strategy.....	30

3.1 Discussion Activity	30
3.2 Methods.....	34
3.2.1 Participants.....	34
3.2.2 Tools.....	34
3.2.2.1 WIDE System.....	34
3.2.2.2 Coding Scheme.....	36
3.2.3 Design.....	38
3.2.4 Procedures.....	38
3.2.5 Data Analysis.....	39
3.3 Results and Discussions.....	40
3.3.1 Content Analysis.....	40
3.3.2 Sequential Analysis.....	43
3.3.3 Original Protocol Analysis.....	48
3.4 Summarizations.....	50
CHAPTER 4 Knowledge Sharing Discussion Activity for Learner Community using a Problem-Solving Strategy.....	52
4.1 Discussion Activity.....	52
4.2 Methods.....	55
4.2.1 Participants.....	55

4.2.2 Tools.....	56
4.2.2.1 WIDE System.....	56
4.2.2.2 Coding Schemes.....	56
4.2.2.3 Scales for Evaluating the Quality of PBL project Reports...	59
4.2.3 Design.....	59
4.2.4 Procedures	60
4.2.5 Data Analysis.....	62
4.3 Results and Discussions.....	63
4.3.1 Content Analysis.....	63
4.3.1.1 Content Analysis of Knowledge Construction.....	63
4.3.1.2 Content Analysis of Problem-Solving.....	66
4.3.2 Sequential Analysis.....	67
4.3.2.1 Sequential Analysis for Knowledge Construction Behavior...	67
4.3.2.2 Sequential Analysis for Problem Solving Behavior.....	69
4.3.3 Original Protocol Analysis.....	72
4.3.4 Differences Analysis.....	76
4.3.5 Correlation Analysis.....	79
4.4 Summarizations.....	80
CHAPTER 5 Knowledge Sharing Discussion Activity for Teacher	

Community using a Problem-Solving Strategy.....	82
5.1 Discussion Activity.....	82
5.2 Methods.....	84
5.2.1 Participants	84
5.2.2 Tools.....	84
5.2.2.1 WIDE-KM System.....	84
5.2.2.2 Coding Schemes.....	87
5.2.3 Design.....	87
5.2.4 Procedures.....	88
5.2.5 Data Analysis.....	89
5.3 Results and Discussions.....	89
5.3.1 Content Analysis.....	90
5.3.1.1 Content Analysis of Knowledge Construction.....	90
5.3.1.2 Content Analysis of Problem-Solving.....	92
5.3.2 Sequential Analysis.....	93
5.3.2.1 Sequential Analysis for Knowledge Construction Behavior...	93
5.3.2.2 Sequential Analysis for Problem Solving Behavior.....	95
5.3.3 Original Protocol Analysis.....	97
5.4 Summarizations.....	101

CHAPTER 6 General Discussions.....	103
6.1 Discussions.....	103
6.2 Suggestions.....	113
CHAPTER 7 Conclusions and Future Works.....	127
7.1 Conclusions.....	127
7.2 Future Works.....	128
REFERENCES.....	131
APPENDIX A The Introduction of WIDE (WIDE-KM) System.....	148

LIST OF TABLES

1. An online knowledge sharing discussion activity with peer assessment.....	33
2. Functions related to online PBL provided by the WIDE system.....	36
3. Gunawardena, Lowe, and Anderson’s Interaction Analysis Model (IAM).....	37
4. Frequency transition table.....	45
5. Adjusted residuals table (Z-scores)	45
6. Extraction of an actual discussion example (Student no.: S041)...	49
7. Online knowledge sharing discussion behaviors that integrate Problem solving.....	55
8. Coding scheme for problem solving discussion.....	58
9. Frequency transition table(C codes, Study II)	68
10. Adjusted residuals table (Z-scores) (C codes, Study II)	68
11. Frequency transition table (P codes, Study II)	70
12. Adjusted residuals table (Z-scores) (P codes, Study II)	70
13. Extraction of an actual discussion example of Study II (Student no.: S009)	73

14. Analysis of the behavioral differences between high-achieving and low-achieving students.....	78
15. Correlation Analysis of each behavioral code and learning achievements.....	79
16. Coding scheme of teachers' problem solving discussion.....	86
17. Frequency transition table(C code, Study III)	93
18. Adjusted residuals table (Z-scores) (C code, Study III)	94
19. Frequency transition table (P code, Study III)	96
20. Adjusted residuals table (Z-scores) (P code, Study III)	96
21. Extraction of an actual discussion example (Teacher no.: n1536, Study III)	98
22. Extraction of an actual discussion example (Teacher no.: n1509, Study III)	99
23. Comparison of content analysis of the sub-studies.....	103
24. Comparison of sequential analysis of the sub-studies.....	104

LIST OF FIGURES

1. The homepage of WIDE-KM, which displays major functions for teachers.....	35
2. Scale map of the coding of knowledge construction in the online discussions	40
3. Behavioral transition diagram for peer assessment online discussions.....	45
4. Scale map of the coding of learners' knowledge construction in the online discussions that integrates a problem solving strategy..	64
5. Scale map of the coding of learners' problem solving in the online discussions that integrates a problem solving strategy.....	66
6. Behavioral transfer diagram (C codes, Study II)	68
7. Behavioral transfer diagram of problem solving-based discussion (P codes, Study II)	70
8. An example of WIDE-KM teachers' problem solving forum.....	85
9. Scale map of the coding of teachers' knowledge construction in the online discussions that integrate a problem solving strategy...	90
10. Scale map of the coding of teachers' problem solving in the online discussions that integrates a problem solving strategy.....	92

11. Behavioral transfer diagram (C code, Study III).....	94
12. Behavioral transfer diagram (P code, Study III)	96
13. Possible sequences that community-guiders could prevent/promote during knowledge sharing discussions.....	119