Insights into the Social Ecology of Information and Communication Technology (ICT) Implementation in Schools: A Quantitative Approach

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ABSTRACT

The purpose of the present study is to develop models to deepen our understanding of how ICT acts as a lever to bring about changes in student learning. Informed mainly by research in three major domains, namely the constructivist views of learning, organisational approach to educational change, and the perspective of looking at ICT use in an organisational context, ICT implementation is framed in an activity system characterised by the interplay between the ICT implementation strategies, pedagogical intervention, and organisational intervention in achieving changes in student learning.

With the questionnaire survey data collected from over 1000 teachers in 130 schools located in various districts of Hong Kong, the present study used structural equation modelling (SEM) techniques to construct a theoretical model depicting the social ecology of ICT implementation by mapping the relationships among ICT implementation strategies, the pedagogical and organisational factors, and changes in student learning. The study was successful in demonstrating that the collegial capacity of ICT implementation strategies mediated the effect of organisational interventions on changes in classroom practices. Specifically, the collegial capacity of school’s ICT implementation strategies affected directly the perceived changes in learning from a teacher-centred approach to a student-centred approach, and indirectly through pedagogical intervention. To deepen our understanding on the SEM model developed, hierarchical linear modelling (HLM) was used to construct a 2-level model to examine the multilevel effects on changes in learning (the outcome variable). Results of the multilevel analysis showed that the regression results obtained from each individual school (in the level-1 model) were consistent with those in the SEM analysis. In addition, the multilevel analysis showed that 14% of the total variation found in changes in student learning was at the school level, which was largely attributable to school-level variables of socio-cultural in nature rather than to the structural characteristics of schools.
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declaration</td>
<td>i</td>
</tr>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>iii</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>iv</td>
</tr>
<tr>
<td>List of Tables</td>
<td>x</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xii</td>
</tr>
<tr>
<td><strong>Chapter 1: Introduction</strong></td>
<td></td>
</tr>
<tr>
<td>Background</td>
<td>1</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>5</td>
</tr>
<tr>
<td>Significance of the Study</td>
<td>8</td>
</tr>
<tr>
<td>Organisation of the Thesis</td>
<td>10</td>
</tr>
<tr>
<td><strong>Chapter 2: Literature Review and Theoretical Framework</strong></td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>15</td>
</tr>
<tr>
<td>An Overview of Educational Change</td>
<td>16</td>
</tr>
<tr>
<td>Emerging Concept of Learning</td>
<td>18</td>
</tr>
<tr>
<td>Constructivism</td>
<td>19</td>
</tr>
<tr>
<td>Roots of constructivism</td>
<td>20</td>
</tr>
<tr>
<td>Constructivist approach to knowledge construction</td>
<td>21</td>
</tr>
<tr>
<td>Constructivist Approach to Teaching and Learning</td>
<td>21</td>
</tr>
<tr>
<td>Concerns over Constructivist Teaching and Learning</td>
<td>22</td>
</tr>
<tr>
<td>Organisational Approach to Manage Educational Change</td>
<td>24</td>
</tr>
<tr>
<td>Implementation of Educational Change at School Level</td>
<td>25</td>
</tr>
<tr>
<td>Organisational Culture</td>
<td>27</td>
</tr>
<tr>
<td>Impact of school culture on organisational effectiveness</td>
<td>28</td>
</tr>
<tr>
<td>School as a Learning organisation</td>
<td>30</td>
</tr>
<tr>
<td>Knowledge management in schools</td>
<td>32</td>
</tr>
<tr>
<td>School Leadership</td>
<td>34</td>
</tr>
<tr>
<td>Conceptualising Leadership</td>
<td>34</td>
</tr>
<tr>
<td>Theories of Leadership</td>
<td>36</td>
</tr>
</tbody>
</table>
### Chapter 4: Results (Part 1) - Instrument Reliability and Validity

**Introduction** 96

**Methods and Results**
- Exploratory Factor Analysis Examining Factor Structure 97
- Internal Consistency Measuring Reliability 103
- CFA Assessing Unidimensionality 103
- Basic Assumption Underlying Use of CFA 105
- Evaluating CFA Model 108
- CFA Results Indicating Unidimensionality 111
- Construct Validity 115
- Convergent Validity 116
- Composite Reliability and Average Variance Extracted 117
- Discriminant Validity 118
- Construct Refinement 123
  - Leadership and climate 124
  - Changes in pedagogy and changes in learning 125
  - Overall validity 126
- Summary 128

**Discussions** 130

### Chapter 5: Results (Part 2) – Model Building

**Introduction** 134

**Methods** 135
- Strategies 136
  - Model comparison strategy 137
  - Nested model comparison 138
- Input Matrix and Estimation Method 138
- Model Evaluation 139
  - Overall fit measures 140
  - Component fit measures 142
  - Model parsimony 142
  - Nested model comparison 143
- Basic Model – Strategic Model 143
Competing Model 1 – Non-mediating Model | 146
Competing Model 2 – Climatic Model | 147
Competing Model 3 – External Model | 148
Competing Model 4 – Pedagogical Model | 149
Competing Model 5 – Strategic and Pedagogical Model | 150

Results and Interpretations | 151
Evaluation of Competitive Models | 152
Overall fit evaluation | 153
Component fit evaluation | 154
Model parsimony evaluation | 155
Investigating Similarities Among Plausible Models | 158
Dichotomy Comparison of Groups of Models | 158
Nested Model Comparison | 160

Summary | 163
Discussions | 164

Chapter 6: Results (Part 3) – Multilevel Model Building

Introduction | 167
Methods and Results

Underlying Principles | 168
Strategies | 172
Defining variables | 173
Step-up strategy | 174
Sample | 176

Variables
Teacher-level (Level-1) variables | 177
School-level (Level-2) variables | 178

Models
Fully unconditional model | 181
Level-1 model | 182
Random coefficient model | 185
Level-2 models | 189
Structural model | 189
Sociocultural model 190
The unified HLM model 192
Discussions 197

Chapter 7: Conclusions and Discussions
Introduction 200
Conclusions 201
Conceptual Model 206
Discussions 208
Limitations and Suggestions 211

Appendix 1: Item of the Questionnaire for the Various Scales 218
Appendix 2: Questionnaire Collecting Supplementary Data 220
References 221
Curriculum Vitae 245