



Virtual Classroom Simulation:

Design and Trial in a Preservice Teacher Education Program

A thesis submitted by

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Simon Skrødal

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*Til min kjære kone Rikki som alltid er der for meg,
vår sønn Haakon og en liten guttunge som snart kommer til verden...*

I love you.

Contents

1. Introduction	1
1.1. Background	2
1.1.1. Commencement of the PhD Candidature	3
1.2. Description of the Virtual Classroom Simulation	5
1.2.1. How it Works	5
1.3. Statement of Research Problems	7
1.3.1. Research Problem 1	8
1.3.2. Research Problem 2	9
1.3.3. Research Problem 3	11
1.4. Participants (Population)	12
1.5. Theoretical Framework	13
1.6. Timeline for Research Study	13
1.7. Research Budget	15
1.8. Intellectual Property	15
1.9. Summary	15
2. Background	17
2.1. Challenges in Education	18
2.1.1. Mental Models, Preconceptions & Schema	18
2.1.2. Practice Teaching	20
2.1.3. Reflective Practice	23
2.1.4. Praxis	24
2.1.5. Student-Teacher Interaction in the Classroom (STIC)	24
2.2. Alternative Solution: Simulation	25
2.2.1. Existing Simulations	27

Contents

2.2.2. Emerging Support for Simulations in Teacher Education	29
2.3. Summary	30
3. Conceptual and Simulation Modelling	33
3.1. Terminology	34
3.2. Social Simulation	37
3.2.1. Agent Based Social Simulation	38
3.3. What is Modelling?	38
3.4. VCS Conceptual Model (VCS Entities)	42
3.4.1. Class	43
3.4.2. Student Entity	44
3.4.2.1. Earlier Work	45
3.4.2.2. Current Development	45
3.4.3. Task Entity	53
3.4.3.1. Earlier Work	54
3.4.3.2. Current Development	55
3.4.4. Teacher Entity	59
3.4.5. States of Interaction	61
3.4.5.1. Simulation ‘Sweeps’	63
3.5. Model Verification and Validation	63
3.6. Summary	65
4. Simulation Framework	67
4.1. Earlier Work	69
4.1.1. Honours Work	69
4.1.1.1. Simulation Framework	70
4.1.1.2. Data Input/Output (Data Management)	71
4.2. Current Development	76
4.2.1. Simulation Framework	76
4.2.1.1. Search for an existing implementation	76
4.2.1.2. Development of a new simulation framework	78
4.2.2. Data Input/Output and Data Management	79
4.2.3. Framework Components	82

4.2.3.1.	SimDBGlobals	83
4.2.3.2.	SimClock	83
4.2.3.3.	EventManager	84
4.2.3.4.	EventDBManager	86
4.2.3.5.	SimManager	86
4.2.3.6.	SimDBManager	87
4.2.3.7.	TasksPanel	89
4.2.3.8.	Student	89
4.2.3.9.	StudentDBManager	95
4.3.	Other Software Features	95
4.3.1.	VCS Console	95
4.3.2.	Persistence	96
4.3.3.	Swing Application Framework (JSR-296)	97
4.3.4.	User Confirmation	97
4.3.5.	Modern Heap View	97
4.4.	Third Party Technologies	98
4.4.1.	Integrated Development Environment	99
4.5.	Summary	100
5.	Graphical User Interface	101
5.1.	GUI Objectives	102
5.1.1.	Lowering the Uptake Threshold	103
5.2.	Earlier Work	106
5.2.1.	First GUI Efforts	106
5.2.2.	Honours Work	107
5.2.2.1.	Status View	108
5.2.2.2.	Task View	109
5.2.2.3.	Classroom View	109
5.3.	Current GUI	110
5.3.1.	Splash Screen	111
5.3.2.	Introduction Window	113
5.3.3.	Student Report Window	116
5.3.4.	Main Window	117

Contents

5.3.4.1. Classroom View	118
5.3.4.2. Status View	121
5.3.4.3. Task View	124
5.3.5. Results Window	125
5.3.6. About Dialog	129
5.4. Graphical Representation of the Classroom and Students	132
5.4.1. Desired Representation	132
5.4.2. Challenges	132
5.4.3. FaceGen	134
5.5. Third Party Technologies	135
5.6. Summary	136
6. Research Design	139
6.1. Population	140
6.2. Ethical Considerations	141
6.3. Methods	141
6.3.1. STIC Questionnaire	141
6.3.2. VCS Introductory Lecture	144
6.3.3. VCS Trials	145
6.3.4. VCS Education Survey	147
6.3.5. VCS HCI Survey	147
6.3.6. VCS Assignment	149
6.4. Data Collection (VCS Surveys)	149
6.4.1. Method of Collection	152
6.4.2. Survey Software	153
6.5. Collected Data	154
6.6. Qualitative Procedures Employed	156
6.6.1. Computerised Text Analysis (CTA)	156
6.6.2. Objectivity and Truth	157
6.6.3. Bias Reduction and Validation	158
6.7. Statistical Procedures Employed	159
6.7.1. Scale Reliability: Cronbach's Alpha	159

6.7.2.	Confirmatory Factor Analysis: Instrument Reliability and Validity	160
6.7.2.1.	Assessment of Model Fit	163
6.7.3.	Rasch Measurement Model	165
6.7.3.1.	Rating Scale Model	167
6.7.3.2.	Model Fit Statistics	167
6.7.4.	Path Analysis	168
6.8.	Summary	170
7.	VCS Qualitative Measures	173
7.1.	Data	174
7.2.	Qualitative Data Analysis Software	175
7.2.1.	SPSS Text Analysis for Surveys	175
7.2.2.	RapidMiner	176
7.3.	VCS STIC Questionnaire	178
7.3.1.	Question 1	179
7.3.2.	Question 2	179
7.3.3.	Question 3	180
7.3.4.	Summary	181
7.4.	VCS Education Survey	182
7.4.1.	Questions 1-3: Quantitative Transformation and Analysis . . .	184
7.4.1.1.	Categorisation	186
7.4.1.2.	Inter-Rater Agreement	186
7.4.2.	VCS Education Survey: Findings	188
7.4.2.1.	Question 1	189
7.4.2.2.	Question 2	190
7.4.2.3.	Question 3	191
7.4.3.	Questions 4-18: Qualitative Analyses Through Double Extraction and Validation	193
7.4.3.1.	Question 4	194
7.4.3.2.	Question 5	196
7.4.3.3.	Question 6	198
7.4.3.4.	Question 7	200

Contents

7.4.3.5. Question 8	201
7.4.3.6. Question 9	204
7.4.3.7. Question 10	205
7.4.3.8. Question 11	208
7.4.3.9. Question 12	209
7.4.3.10. Question 13	210
7.4.3.11. Question 14	211
7.4.3.12. Question 15	212
7.4.3.13. Question 16	214
7.4.3.14. Question 17	216
7.4.3.15. Question 18	217
7.5. Limitations	218
7.6. Summary	219
8. Computer Familiarity Scale	221
8.1. Data	222
8.2. The Instrument	223
8.2.1. Comfort With and Perceived Ability to Use Computers Scale (COMAB)	224
8.2.2. Computer Usage Scale (COMUSE)	224
8.2.3. Interest in Computers Scale (COMATT)	226
8.2.4. Computer Usage Frequency Scale (COMFREQ)	226
8.3. Scale Structure Analysis	227
8.3.1. Reliability of Scales	227
8.3.2. Confirmatory Factor Analysis	229
8.3.2.1. Comfort With and Perceived Ability to Use Computers (COMAB/COMCOMF)	230
8.3.2.2. Interest in Computers (COMATT)	231
8.3.3. Rasch Model Item Analysis	233
8.3.3.1. Comfort With and Perceived Ability to Use Computers (COMAB/COMCOMF)	233
8.3.3.2. Interest in Computers (COMATT)	234
8.4. Considerations and Limitations	235

8.4.1. CFA and Sample Size	235
8.5. Summary	236
9. User Interaction Satisfaction Scale	237
9.1. Data	238
9.2. The Instrument	238
9.2.1. Overall User Reactions Scale (VCSREA)	240
9.2.2. Screen Preferences Scale	241
9.2.3. Terminology and System Information Scale	242
9.2.4. System Operations and Learning Scale	243
9.2.5. System Capabilities Scale	243
9.2.6. Comments (Qualitative)	244
9.3. Reduction of Item Response Options	245
9.4. Scale Structure Analysis	246
9.4.1. Reliability of Scales	246
9.4.2. Confirmatory Factor Analysis	247
9.4.2.1. Overall User Reactions Sub-Scale (VCSREA)	249
9.4.2.2. Screen Sub-Scale	251
9.4.2.3. Terminology and System Information Sub-Scale	252
9.4.2.4. Learning Sub-Scale	252
9.4.2.5. System Capabilities Sub-Scale	253
9.4.3. Rasch Model Item Analysis	253
9.4.3.1. Overall User Reactions (VCSREA)	254
9.5. Considerations and Limitations	254
9.5.1. CFA and Sample Size	254
9.6. Summary	256
10.Improving Education Students' Understanding of Classroom Interactions	257
10.1. Structural Equation Modelling and Causal Relationships	259
10.1.1. Reliability and Validity of Variables	259
10.1.2. W-Scale and Latent Variable Scores (LVS)	259
10.1.3. Missing Values	261

Contents

10.2. Path Analysis	261
10.2.1. Limitations	270
10.3. VCS Assignment: Summative Assessment in the STIC Course	270
10.4. Observations From the Assignments	271
10.4.1. ST0058 (Male)	272
10.4.2. ST0159 (Female)	273
10.4.3. ST0087 (Male)	274
10.4.4. ST0148 (Female)	275
10.4.5. ST0059 (Male)	275
10.4.6. ST0139 (Female)	276
10.4.7. Discussion	278
10.5. Summary	278
11. Conclusion	279
11.1. Research Problem 1 (RP1)	281
11.1.1. Outcomes	281
11.1.2. Research Findings	282
11.1.3. Comments	283
11.2. Research Problem 2 (RP2)	283
11.2.1. Outcomes	284
11.2.2. Research Findings	287
11.2.3. Comments	289
11.3. Research Problem 3 (RP3)	289
11.3.1. Research Findings	291
11.3.2. Concluding Remarks	293
11.4. Implications of the study	293
11.4.1. Theoretical Implications	293
11.4.2. Methodological Implications	294
11.4.3. Implications for Simulation Design	295
11.4.4. Implications for Practice	296
11.4.5. Implications for Further Research	296
11.4.6. Limitations of the Study	297
11.5. Concluding Remarks	297

A. Software and Resources	299
A.1. Operating Systems	299
A.2. For Software Development	300
A.2.1. Platforms	300
A.2.2. Applications	300
A.2.3. Libraries and Modules	301
A.3. For Data Collection, Analysis and Reporting	302
A.3.1. Data Collection	302
A.3.2. Data Analysis and Mining	303
A.3.3. Reporting	304
A.4. For Graphical Representation	305
A.5. Other	306
A.5.1. Utilities	306
A.5.2. Icons	306
B. VCS Virtual Students	309
C. Email Correspondence With a Professor From a Technology Institute in Sweden	311
D. Email Correspondence With an A/Prof From a University in the USA	315
E. Email Correspondence with J-Sim Developer	317
F. VCS Results Help Dialog	319
G. VCS About Dialog	323
H. Ethical Approval	327
I. Student Teacher Interaction in the Classroom 1 — Course Outline	329
J. VCS STIC Questionnaire — Pre-Lecture	337
K. VCS Student Report Cards	339
L. VCS STIC Lecture	341

Contents

M. Research Project Information Sheet	351
N. Consent Form	353
O. VCS Trial Instruction Sheet	355
P. Deployment Issues	357
P.1. Java Compatibility	357
P.2. Portability	358
P.3. Host System Restrictions	359
P.4. Delays	360
P.5. Summary	360
Q. VCS STIC Assignment	361
R. VCS Education Survey	365
S. VCS HCI Survey	373
T. VCS Survey Codebook	383
U. Email Correspondence With a Lecturer From a University in the USA	387
V. Email Correspondence With a University Professor From Greece.	389
W. VCS Assignment Submissions	391
W.1. VCS Assignment, Student 0058	391
W.2. VCS Assignment, Student 0159	397
W.3. VCS Assignment, Student 0087	401
W.4. VCS Assignment, Student 0148	404
W.5. VCS Assignment, Student 0059	410
W.6. VCS Assignment, Student 0139	414
References	419
Nomenclature	441
Nomenclature	441

List of Tables

1.1. Population and Gender Distribution	12
3.1. Original Class Attribute Listing (Honours Study, Skrødal, 2003) . . .	43
3.2. Original Student Attribute Listing (Honours Study, Skrødal, 2003) . .	46
3.3. VCS Student Attributes (Current Study)	48
3.5. Original Task Attribute Listing (Honours Study, Skrødal, 2003) . . .	54
3.6. Original Teacher Attribute Listing (Honours Study, Skrødal, 2003) . .	60
5.1. Custom tags added to <code>about.html</code>	131
6.1. Population and Gender Distribution	141
6.2. VCS Education Survey: Question Items	148
6.4. VCS STIC Questionnaire Respondents and Gender Distribution . . .	156
6.5. VCS Education Survey Respondents and Gender Distribution	156
6.6. VCS HCI Survey Respondents and Gender Distribution	157
7.1. Word Frequency, Question 1	180
7.2. Word Frequency, Question 2	181
7.3. Word Frequency, Question 3	182
7.4. Response Themes and Categorisation, Question 3	182
7.5. VCS Education Survey: Question Items	183
7.6. Categories and Schemes Established for Question 1	187
7.7. Categories and Schemes Established for Questions 2 and 3	188
7.8. Inter-Rater Agreement for Questions 1, 2 and 3	188
7.9. Response Frequencies, Question 1	189
7.10. Response Frequencies, Question 2	191
7.11. Response Frequencies, Question 3	192

List of Tables

7.12. Response Themes and Categorisation, Question 4	195
7.13. Word Frequency, Question 4	196
7.14. Response Themes and Categorisation, Question 5	197
7.15. Word Frequency, Question 5	198
7.16. Response Themes and Categorisation, Question 6	199
7.17. Response Themes and Categorisation, Question 7	200
7.18. Word Frequency, Question 7	201
7.19. Response Themes and Categorisation, Question 8	202
7.20. Response Themes and Categorisation, Question 9	204
7.21. Response Themes and Categorisation, Question 10	206
7.22. Response Themes and Categorisation, Question 11	209
7.23. Response Themes and Categorisation, Question 12	209
7.24. Response Themes and Categorisation, Question 13	210
7.25. Response Themes and Categorisation, Question 14	211
7.26. Response Themes and Categorisation, Question 15	213
7.27. Response Themes and Categorisation, Question 16	215
7.28. Response Themes and Categorisation, Question 17	217
7.29. Response Themes and Categorisation, Question 18	217
8.1. PISA Sub-Scale of Comfort With and Perceived Ability to Use Computers	224
8.2. VCS Sub-Scale of Comfort With and Perceived Ability to Use Computers	224
8.3. PISA Sub-Scale of Computer Usage	225
8.4. VCS Sub-Scale of Computer Usage	225
8.5. PISA Sub-Scale of Interest in Computers	226
8.6. VCS Sub-Scale of Interest in Computers	226
8.7. PISA Sub-Scale of Computer Usage Frequency	227
8.8. VCS Sub-Scale of Computer Usage Frequency	227
8.9. Reliability Comparison for Computer Familiarity Scales	228
8.10. Factor Loadings of the Single-Factor Model for Computer Comfort . .	231
8.11. Factor Loadings of the Single-Factor Model for Interest in Computers	232
8.12. Goodness of Fit Statistics for Interest in Computers	232

8.13. Response Model Parameter Estimates for Comfort With and Perceived Ability to Use Computers (COMCOMF)	233
8.14. Response Model Parameter Estimates for Interest in Computers (COMATT)	234
8.15. Response Model Parameter Estimates for Interest in Computers (COMATT)	235
9.1. Overall User Reactions Sub-Scale	241
9.2. Screen Sub-Scale	241
9.3. Terminology and System Information Sub-Scale	242
9.4. Learning Sub-Scale	243
9.5. System Capabilities Sub-Scale	244
9.6. Reliability Comparison for User Interaction Satisfaction/QUIS Sub-Scales	247
9.7. QUIS Interface Factors	248
9.8. Factor Loadings of the Single-Factor Model for Overall Reactions to the VCS	250
9.9. Goodness of Fit Statistics for Interest in Computers	251
9.10. Response Model Parameter Estimates for Overall User Reactions (VCSREA)	255
9.11. Response Model Parameter Estimates for Overall User Reactions (VCSREA)	255
10.1. VCS-Specific Variables in the Theoretical Model	262
10.2. Standardised Estimates and <i>t</i> -Values (<i>t</i> -values in parenthesis)	265
10.3. Variables Used in the Path Model	266
11.1. Core Entity Attributes of the Conceptual Model	282
11.2. User Interaction Satisfaction Scale— Summary of Responses	287
T.1. VCS Survey Codebook, Section 1: Personal Details	383
T.2. VCS Survey Codebook, Section 2: Experience in ICT	384
T.3. VCS Survey Codebook, Section 3: Overall User Reactions (VCS)	385

List of Tables

T.4. VCS Survey Codebook, Section 4: VCS Education Survey
(Quantification) 386

List of Figures

1.1. Trans-Disciplinary Composition of the VCS	2
1.2. Trans-Disciplinarity (Koizumi, 1999 in OECD, 2002, p. 85)	4
1.3. Screen Captures of VCS Windows	6
1.4. Abstract View of the Theoretical Model	13
1.5. Research & Development Timeline	14
2.1. Intersect of Content and Pedagogy (based on Shulman, 2000, p. 64) .	19
2.2. Screen Capture of the simSchool Simulation	28
3.1. Simplified Version of the Modelling Process (adapted from Sargent, 2005, p. 132)	34
3.2. System Deconstruction of an Analog Wristwatch	39
3.3. Mood Range for Student Elias (see Appendix B for all students) . . .	52
3.4. First Version of Generic Tasks	56
3.5. Final Version of Generic Tasks	58
3.6. VCS States of Interaction Overview	62
3.7. Inclusion of Interaction States in Results Charts	63
4.1. Simulation Flowchart	80
4.2. Basic system concepts (adapted from Zeigler et al., 2000, p. 4)	81
4.3. VCS Database Schema	82
4.4. Overview of the Broadcast and Logging of a Question Event	85
4.5. VCS Database Initialisation Overview	88
4.6. Overview of the Ask Question Event	93
4.7. Overview of the Ask Student Event	94
4.8. VCS Console	96
4.9. User Confirmation Dialogs	98

List of Figures

4.10. Modern Heap View Component	98
5.1. Divide between markets (adapted from Moore, 1995, p. 19)	104
5.2. One of the first GUI representations of the VCS classroom (2002)	107
5.3. Honours version of the VCS (main window)	108
5.4. Status view (Honours version,)	108
5.5. Task view (Honours version)	109
5.6. Class view (Honours version)	110
5.7. VCS Splash Screen	112
5.8. VCS Introduction Window	114
5.9. Student Report Window	116
5.10. 3-Panel View of the Main Window	117
5.11. Screen Resolution Warning	119
5.12. Classroom Views Before and After Lesson Start	120
5.13. Student Panels	121
5.14. Status View	122
5.15. Task View	124
5.16. Results Window	127
5.17. Student Chart (Maja) Explained	128
5.18. Menu Access for the Event Table	129
5.19. About Dialog	130
5.20. Student Representation in VCS Prototype 2003	133
5.21. Student Faces Generated With FaceGen Modeller	135
6.1. Mixed Methods Approach of this Study (adapted from Hurmerinta- Peltomäki and Nummela, 2006, p. 445)	140
6.2. Timeframe of the Population's Involvement with the VCS	142
6.3. Sequence of Activities Involving Participants	143
6.4. VCS Surveys	143
6.5. STIC Questionnaire Word Cloud	145
6.6. VCS Trial: Sequence of Events	146
6.7. VCS HCI Survey Composition	149
6.8. Questionnaire for User Interaction Satisfaction v.5.0 (captured from Chin et al., 1988, p. 215)	150

6.9. Computer Familiarity Questionnaire (captured from OECD, 2000) . . .	151
6.10. Screenshot of a VCS HCI Survey Page	155
6.11. Measurement Model	161
6.12. Statistical Data Analysis as Interaction Between Theory and Reality (Kühnel, 2001, p. 95)	169
6.13. Detailed View of the Theoretical Model	171
7.1. Timeframe of the Population's Involvement with the VCS	174
7.2. RapidMiner Process Template for Analysis of VCS Qualitative Data .	176
7.3. Targeted areas of the VCS Education Survey	185
8.1. VCS HCI Survey Composition	222
8.2. Computer Familiarity Scale	223
8.3. Single-Factor Model for Computer Comfort (COMCOMF)	230
8.4. Single-Factor Model for Interest in Computers	232
9.1. VCS HCI Survey Composition	238
9.2. Structure of the User Interaction Satisfaction Scale	240
9.3. Structure of the Single-Factor Model for the Overall Reactions to the VCS Sub-Scale	249
9.4. Survey Layout of VCSREA Sub-Scale	251
9.5. Structure of the Single-Factor Model for the Screen Sub-Scale	252
9.6. Structure of the Single-Factor Model for the Terminology and System Information Sub-Scale	253
9.7. Structure of the Single-Factor Model for the Learning Sub-Scale . . .	253
9.8. Structure of the Single-Factor Model for the System Capabilities Sub- Scale	254
10.1. Types of Mixed Methods Designs (adapted from Creswell, 2008, p. 557)	258
10.2. Detailed View of the Final Theoretical Model for Analysis	260
10.3. Confirmed Theoretical Model (N=165)	264
10.4. STIC Assignment Diagrams	272
11.1. VCS Feedback Cycle	294

List of Figures

B.1. VCS Students' Mood States	309
F.1. VCS Results Help Dialog	319
F.2. VCS Results Help File, Page 1	320
F.3. VCS Results Help File, Page 2	321
F.4. VCS Results Help File, Page 3	322
G.1. VCS About Dialog Information, Page 1 of 2	324
G.2. VCS About Dialog Information, Page 2 of 2	325
H.1. Ethical Approval	328
I.1. STIC 1 Course Outline 1/6	330
I.2. STIC 1 Course Outline 2/6	331
I.3. STIC 1 Course Outline 3/6	332
I.4. STIC 1 Course Outline 4/6	333
I.5. STIC 1 Course Outline 5/6	334
I.6. STIC 1 Course Outline 6/6	335
J.1. VCS Questionnaire — Pre-Lecture	338
K.1. VCS Student Report Cards	340
L.1. Slides 1-3	342
L.2. Slides 4-6	343
L.3. Slides 7-9	344
L.4. Slides 10-12	345
L.5. Slides 13-15	346
L.6. Slides 16-18	347
L.7. Slides 19-21	348
L.8. Slides 22-24	349
M.1. Research Project Information Sheet	352
N.1. Consent Form	354
O.1. VCS Trial Instruction Sheet	356

Q.1. VCS STIC Assignment	362
Q.2. Student Graph 1	363
Q.3. Student Graph 2	364
R.1. VCS Education Survey, Page 1/7: Information	366
R.2. VCS Education Survey, Page 2/7: Personal Details	367
R.3. VCS Education Survey, Page 3/7: Part A	368
R.4. VCS Education Survey, Page 4/7: Part B	369
R.5. VCS Education Survey, Page 5/7: Part C	370
R.6. VCS Education Survey, Page 6/7: Part D	371
R.7. VCS Education Survey, Page 7/7: Thank You	372
S.1. HCI Online Survey, Page 1/10: Information	374
S.2. HCI Online Survey, Page 2/10: Personal Details	375
S.3. HCI Online Survey, Page 3/10: Experience in ICT	376
S.4. HCI Online Survey, Page 4/10: Overall Reactions	377
S.5. HCI Online Survey, Page 5/10: Screen	378
S.6. HCI Online Survey, Page 6/10: Terminology and System Information	379
S.7. HCI Online Survey, Page 7/10: Learning	380
S.8. HCI Online Survey, Page 8/10: System Capabilities	381
S.9. HCI Online Survey, Page 9/10: Comments	382
S.10. HCI Online Survey, Page 10/10: Thank You	382
W.1. VCS Assignment (Student 0058), Page 1	392
W.2. VCS Assignment (Student 0058), Page 2	393
W.3. VCS Assignment (Student 0058), Page 3	394
W.4. VCS Assignment (Student 0058), Page 4	395
W.5. VCS Assignment (Student 0058), Page 5	396
W.6. VCS Assignment (Student 0159), Page 1	398
W.7. VCS Assignment (Student 0159), Page 2	399
W.8. VCS Assignment (Student 0159), Page 3	400
W.9. VCS Assignment (Student 0087), Page 1	402
W.10. VCS Assignment (Student 0087), Page 2	403
W.11. VCS Assignment (Student 0148), Page 1	405

List of Figures

W.12VCS Assignment (Student 0148), Page 2	406
W.13VCS Assignment (Student 0148), Page 3	407
W.14VCS Assignment (Student 0148), Page 4	408
W.15VCS Assignment (Student 0148), Page 5	409
W.16VCS Assignment (Student 0059), Page 1	411
W.17VCS Assignment (Student 0059), Page 2	412
W.18VCS Assignment (Student 0059), Page 3	413
W.19VCS Assignment (Student 0139), Page 1	415
W.20VCS Assignment (Student 0139), Page 2	416
W.21VCS Assignment (Student 0139), Page 3	417
W.22VCS Assignment (Student 0139), Page 4	418

List of Algorithms

4.1. XML Structure of a VCS Class	75
4.2. SQL Statement for the Events Table	83
4.3. Mapping of Event Codes and Descriptors	84
4.4. Student Instantiation	90
5.1. VCS Session File (‘.vcs’)	115

Abstract

“The Virtual Classroom Simulation, Design and Trial in a Preservice Teacher Education Program” (VCS), is trans-disciplinary research study that aimed to design, embed, trial and evaluate a simulation system and its learning outcomes. This document encapsulates the motivation, conceptualisation, theory, development, trials and evaluation behind the study. Expert technology transfer, particularly from areas in education, psychology, social sciences, conceptual modelling, computer science and underlying mixed methods research design, has been instrumental in underpinning the research and development of the VCS.

Prospective education students have preconceived ideas, or mental models, about teaching and learning that are often based on their own experiences as students. The School of Education at the University of Adelaide offers a number of courses that provide insights into both the theory and practice of education. The practicum component provides a valuable, real-life, experience that may improve education students’ understanding about teaching, learning and classroom interactions. It may also enable them to better understand and apply effective teaching strategies to enhance student learning outcome. Some research studies, however, suggest that providers of teacher education do not sufficiently stimulate education students to challenge their own preconceptions about teaching and learning.

This study aimed to identify and deconstruct essential attributes of a specific teaching-learning context and reconstruct these in a virtual environment. *It involved the development of an interactive computer simulation training tool to be trialled in a population of education students.* The simulation was projected to be an important enabler of praxis (the nexus between theory, reflection and practice), thus useful in challenging and adjusting education students’ mental models about student-teacher interaction.

The VCS and related materials (lecture, trial, surveys and assignment) were

integrated in the first-semester course “Student-Teacher Interaction in the Classroom 1”, a compulsory course for students enrolled in the degrees of Bachelor of Teaching (4th year) and Graduate Diploma in Education. Prior to the delivery of an introductory lecture and administration of VCS user trials, student perceptions and views about the teacher, students, task and learning environment were elicited. The VCS and associated activities provided a gauge to understand changes to education students’ mental models. *To determine and evaluate the effectiveness of the VCS and related learning, a number of objective measurement techniques and methods were used. In order to complement the quantitative methods utilised, qualitative research methods were used to examine the rich data source obtained through open-ended questions posed to the students.*

Many research studies have positioned the value of mixed-methods. *This study highlights the value of triangulation and the use of exploratory, explanatory and confirmatory models in understanding the interactions between the variables under study.* The research adapted carefully chosen instruments utilised in international studies, and these were re-validated through well established techniques such as confirmatory factor analysis and the Rasch Model. A substantial amount of qualitative data was quantified to add more detail in the structural equation model.

Path analysis of quantitative data suggests that the overall reactions to the VCS system were influenced by participants’ comfort with computers. The educational value of the simulation, as perceived by the population, was strongly linked to the overall reaction to the VCS. More than 80% of the population viewed the educational value of the VCS as either high (~62%) or moderate (19%). A further ~70% thought that the VCS delivered an effective means of training. A majority of the participants (~75%) also believed that the VCS generated a valuable learning experience.

The findings are supported and enriched by the analysis of qualitative data, which shows that participants demonstrated a noticeable advancement in their level of thinking and understanding of educational theories induced through VCS interaction. Results from a VCS-related assignment, which made part of the education students’ formal assessment in the course, validate these findings.

One cycle of VCS development, course integration, and user trials was implemented in this study. The final outcomes suggest that the VCS added value

to a population in teacher education. Experiences and feedback from the population also introduced a number of areas to consider for future research and development.

The study concludes that more research and development be put into the VCS with the aim of making the system available to all providers of teacher education in Australia. It further highlights the need for quality assurance for any simulation (or objects) developed for learning. The triangulation of research methods highlights the contribution of mixed methods to this pertinent study.

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It has been said more than a couple of times that a PhD research study can be a daunting and prolix affair. This could not be any further from the truth if you ask me. True, the past few years do feel like a lifetime, but only because they have been filled with so many diverse and rewarding experiences.

A rather important objective of a candidature is to receive a certificate of PhD. Along the way, I have managed to pick up a few others as well. No more than one wedding certificate (thankfully) and no less than two birth certificates are certainly the most precious awards that I will ever receive in my lifetime. A very special thank you is therefore apposite for my wife Rikki, who is such an amazing, inspirational, supportive and loving partner, friend, mother and teacher; you are the best ‘better half’ that has ever existed in the history of the world.

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Awards and Publications

Awards

- This research study was supported by the Australian Postgraduate Awards Scheme (APAs).
- The researcher was successful in receiving the Commercialisation Training Scheme (CTS), an award designed to develop the commercialisation skills of up and coming researchers. It covered tuition fees up to the value of \$8,500AUD and scholarship payments to the researcher of \$12,000AUD in total. The award was put towards a Graduate Certificate in Science and Technology Commercialisation.
- The researcher received a Graduate Certificate in Science and Technology Commercialisation from the Entrepreneurship, Commercialisation and Innovation Centre (ECIC), University of Adelaide, in 2009.

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Other

- Alagumalai, S., Skrødal, S. and Ben, F. (2009). Funding awarded by the PVC (L&Q), University of Adelaide, to undertake the *Effective Feedback Project*. Poster selected to be presented at the Inaugural Education Expo (May, 2010).
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